

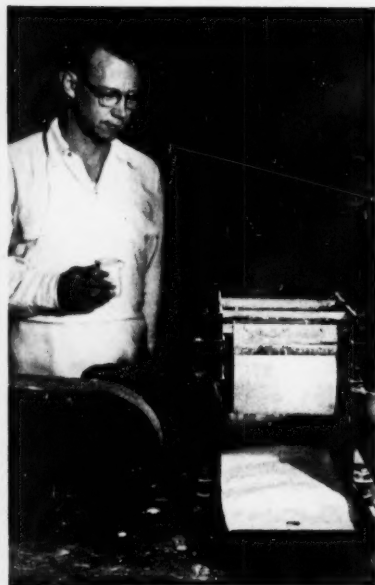
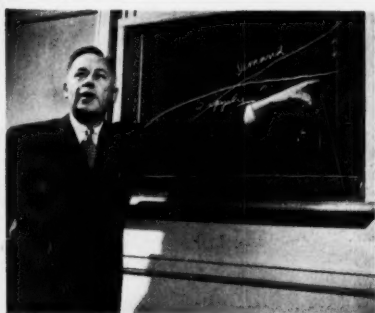
Chemical

INDUSTRIES

April 14, 1951

Price 35 cents

Week



Phthalic shortage pushes maleic anhydride into spotlight, spurs output p. 11

◆ **Du Pont's Jones: technical savvy now a must for astute purchasing; key to steady operation p. 13**

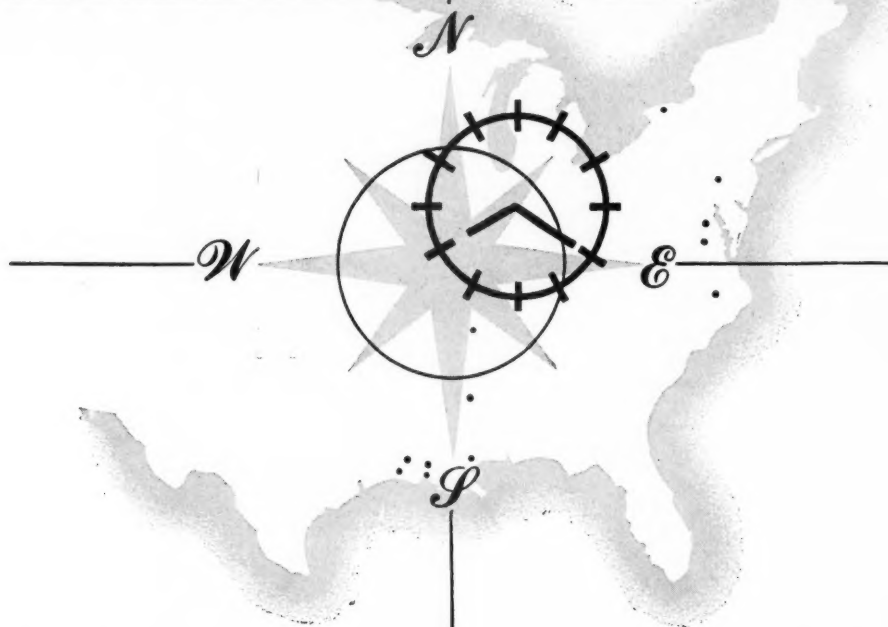
◆ **CIW Camera tours food chemical lab; eyes research in action to protect public p. 18**

Gasketmakers adopt "noble plastics;" Aim: fewer shutdowns in chemical plants p. 29

Powder bleaches engage in lusty battle for household market; advantage: convenience p. 33

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Chemical Industries Week—

April 14, 1951

Volume 68

Number 13

| | |
|---------------------|----|
| OPINION | 2 |
| NEWSLETTER | 5 |
| BUSINESS & INDUSTRY | 11 |
| RESEARCH | 23 |
| PRODUCTION | 29 |
| SPECIALTIES | 33 |
| MARKETS | 37 |
| BOOKS | 41 |
| BOOKLETS | 44 |



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April 14, 1951

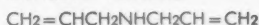
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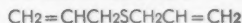
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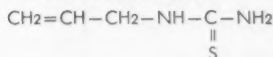
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OPINION

No Home Reflectometer

TO THE EDITOR: Your article, "Liquid Detergent Surge," is both timely and well-presented. Somewhat limited experience with these materials indicates that they merit a significant place among modern detergents . . .

However, do not be too restrictive in the usages for liquid detergents.

Although classified for light duty, they will be put to heavy-duty work and in many instances . . . will be found to give acceptable results.

Remember, the housewife likes to do as many cleaning jobs as possible with the same detergent, and she does not have a reflectometer for measuring soil removal.

WILLIAM W. NIVEN, JR.
Senior Research Chemist
Midwest Research Institute
Kansas City, Mo.

A good point. Detergency is a low rung criterion for the success of a retail cleaner. High on the roster of selling qualities: odor, color, convenience, sudsing.—Ed.

Kudos

TO THE EDITOR: The new CHEMICAL INDUSTRIES WEEK is the most interesting publication that has come across my desk.

The manner in which this is drawn up is excellent—the editorial matter, chemical, markets, advertising and all. Congratulations to you. . . .

DON CUSHMAN
Vice President in Charge of Sales
Innis, Speiden & Company
New York, N. Y.

Pilot vs. Small Scale

TO THE EDITOR: Your article, "Experts Probe Pilot Plants," in the March 31 issue, brings out a few points which I believe could well be further discussed. The White Sulphur Springs Symposium dealt mainly with pilot-scale equipment and methods of scale-up, rather than with what is commonly understood to be pilot plants. There is no question but that considerable disagreement was indicated as to the nature of a pilot plant . . . the term was applied to both the above types of small-scale operations. . . .

A pilot, or small-scale apparatus, used to obtain information which can be used in some ways to design full-sized commercial equipment, is not, in my opinion, a pilot plant. Such

apparatus could be exemplified by small-sized filters, centrifuges, mixers, towers, etc., not necessarily exactly the same design as that contemplated for commercial use.

On the other hand, pilot plants should be . . . integrated units, employing . . . a number of unit operations; and their purposes may be many, as follows:

1. To obtain process information, such as yields, quality of products, optimum operating conditions, as temperature, pressure and reflux ratios, etc., and sometimes physical and chemical properties of materials involved;

2. To study the effect of variables which can be evaluated only by continuous, relatively long-time operation, following closely the processing steps which will occur in the chemical unit. Examples are the determination of the effect of small quantities of impurities which may build up in the system, effect of recycle, catalyst deactivation and life, attrition, corrosion, etc.;

3. To prove many, or all, of the steps in a process, many of which would be impossible without having a more or less integrated unit;

4. To obtain reasonable size samples of products for evaluation;

5. To obtain information necessary for the design of commercial equipment where this cannot be obtained by the study of the operation of small individual pieces of equipment alone, as, for instance, in the case of a new-type extraction apparatus.

With the exception of the last item, no real scale-up problem is involved.

The engineer can design the commercial equipment to do the job before he wishes to know exactly what that job will be.

WALTER E. LOBO, Director
Chemical Engineering Division
The M. W. Kellogg Company
New York, N. Y.

Polish Pioneer

TO THE EDITOR: Thank you! Your recent article (The New "Sell" in Polishes, March 10) on silicone furniture polishes was complete, accurate and fair, and we are gratified by the mention you made of our product and history.

All too often the impression is given that only very large, long-established corporations come up with truly remarkable advances in any given technical field; the development of sil-

cone polishes is one exception and we are pleased to find that we were not overlooked by CIW in the stampede.

As you know, we were the first to recognize the advantages of a solvent-dispersed wax-silicone combination and the first to put that discovery to practical use. Proof that we were right: "Dri-Glo" and "Pride," to mention only two. . . .

H. C. GEEN
Tone Manufacturing Company
Grand Rapids, Mich.

Squarely or Not?

TO THE EDITOR: In your news article on silicone furniture polishes (The New "Sell" in Polishes, March 10), you say that the introduction of new products by S. C. Johnson, Boyle-Midway and O'Cedar Corp. puts the big three "squarely on the silicone bandwagon."

A few paragraphs later you mention that "Johnson is pushing its product Pride which it coyly does not say is a silicone product but doesn't deny either." Squarely on the silicone bandwagon or not-so-squarely?

J. T. CONNER
Houston, Texas

CIW, as coy as Johnson, also said—"A trade-held belief: Johnson has been Mr. Wax for some 18 years, prefers to cash in on its "wax" reputation by placing main emphasis on the wax-like worth of its product." Officially, Johnson is mum on the silicone question; unofficially, CIW will eat a silicone-impregnated hat if Pride is not a silicone-containing polish.—Ed.

Farsighted Marketing

TO THE EDITOR: We appreciate the generous references to our organization in the article by Dr. Idson on Antihistamine drugs (March 31). In column 2, page 9, of that issue we note the following:

"Shortly after the antihistamines demonstrated their value in allergies, dimethylaminoethanol appeared commercially from Sharples Chemicals. Carbide and Carbon has since offered it."

We should like to point out . . . that our Organic Synthesis Fellowship, at Mellon Institute of Industrial Research in Pittsburgh, shipped drum quantities of dimethylethanolamine for experimental use, beginning in 1941. In 1945, regular commercial

orders were received by us . . . and production was begun in our plant at South Charleston, West Virginia.

Since that time, production has increased from approximately drum-per-month basis to multi-drum quantities.

Thus, we believe that Dr. Idson's article might be corrected to indicate that "shortly before the antihistamines demonstrated their value in allergies, Carbide and Carbon offered dimethylaminoethanol commercially." However, in such a detailed and comprehensive article, this point might easily be overlooked.

J. CONWAY
Fine Chemicals Department,
Carbide and Carbon Chemicals Co.
New York, N. Y.

Coal Value

TO THE EDITOR: CIW (March 10, 1951, p. 23) says "coal in thin seams (3' to 6' in thickness) . . . is worth only about 10¢ per ton underground because of the great cost of mining."

I'll pay you more than 10¢ for coal 3 to 6 feet thick.

CHARLES R. DOWNS
Consultant
New York City

Reader (and Consulting Editor) Downs could certainly pay us more than 10¢ and still make a nice profit. We should have said "small" rather than "thin," for it is the small total quantity available from the seams in question rather than their relative thinness that makes ordinary mining unprofitable. Large seams of the same thickness are worth considerably more.—Ed.

Fission Research

TO THE EDITORS: . . . I have just read your report (Mar. 24) on the "Industrial Utilization of Fission Products" . . .

. . . the article is excellent . . . we appreciate the coverage you gave our project. . . .

W. E. HOKSEN
Stanford Research Institute
Stanford, Cal.

CIW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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Chemical Industries Week

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NEWSLETTER

Definite action to "share the shortages" is accelerating this week as the list of chemicals under NPA control lengthens. A new order covering sulfuric acid, adding it to Appendix B under the general chemicals allocation order M-45, will govern delivery in the eleven Far Western states, where supply is a critical local problem. Deliveries will not be permitted there without specific NPA authorization. In the rest of the country customers will have to tell suppliers how the acid is being used, and the suppliers in turn will report to NPA.

Allocation of sulfur—basic to the acid problem—is under study, and you can expect a decision soon.

Teflon (tetrafluoroethylene polymer) goes under complete allocation (Appendix A) May 1. That means that Du Pont, the only manufacturer, must get specific NPA permission to deliver, and customers must get authorization to accept delivery. Entire production now goes to the defense program.

On the brighter side is NPA's modification of its fiat requiring DDT makers to accept DO orders up to a quarter of their monthly output. The ceiling will now be lowered to 20%, which is more in line with actual military needs during the first three months of the year.

In platinum, the chemical industry's gain is the jewelers' loss. NPA's M-54 order prohibits use of the metal in jewelry and other non-essential uses. These consumers can use up what they have—and that's all.

Spotlight has been on shortages of materials, but chemical firms are increasingly concerned about the thinning ranks of technical manpower. At Boston last week, and at Cleveland this week, some industry representatives were registered at the American Chemical Society meetings for the sole purpose of looking around for men. One large company reports a deficit of over 1,000 technical people; another is sending personnel scouts to the lesser-known small colleges, signing up June chemistry graduates.

One untapped reservoir of job talent is the young college instructors, many of whose contracts are not being renewed for 1951-2 in view of the inevitable decrease in college enrollment.

Reasons for the manpower pinch: military call-ups, dizzy-paced chemical expansion, stepped-up recruiting for atomic installations.

Faster tempo of atomic activity is underscored by AEC's plans for a \$30 million uranium ore refinery on a 1,200-acre site 19 miles northwest of Cincinnati. To employ some 1,200 people, the plant will turn out uranium in forms suitable for processing to fissionable materials. Catalytic Construction Corp. (Philadelphia) is designing it, but building and operating contractors haven't yet been named.

And in Boulder, Colo., the AEC is building a specialized research laboratory—that's all the Commission will say—on National Bureau of Standards land. Bureau personnel will operate it.

Price ceilings on wood pulp and used steel drums loomed this week as the Office of Price Stabilization readied roll-backs on these items. Industry advisory committees agreed to specific dollars-and-cents ceilings on standard grades of wood pulp (to be based on 1950 cost data), and on used drums and reconditioning services.

Last Tuesday most petroleum products were removed from the general ceiling price regulation at the wholesale level and placed under a new, specially designed order (CPR 17). Some price increases may result.

Encouraged by growth of the economy, particularly in the Midwest, Wyandotte Chemicals Corp. is embarking on an ambitious expansion program over the next several years. First target: sizable expansion of chlorine, caustic and soda ash, together with processing facilities for organics. In the future: additional, unspecified projects now under consideration in research and development and manufacturing engineering departments.

A new research center and pilot plant will be completed next year. Technical service will be upped along with research.

Burgeoning demand for chemicals and allied products is the spark that touched off several expansions this week.

Manganese dioxide production will be jumped tenfold by Western Electrochemical Co. at Henderson, Nev. Starting off at a ton a day early this year, output will hit 10 tons daily by August, may be upped to 50 tons later. Major market: batteries for the Signal Corps.

A fourth elemental phosphorus furnace at Pocatello, Idaho, has been scheduled by Westvaco (Food Machinery & Chemical Corp.) just as the third furnace nears completion. The \$9.4 million investment in the third and fourth furnaces will bring capacity to 37,000 tons a year.

Raw material for the Pocatello operation is no immediate worry. The phosphate shale obtained under contract from J. R. Simplot Co. can keep the four furnaces working at rated capacity for at least 25 years.

Also in the West, Monsanto is planning to make vanillin from lignin at Seattle. Crude vanillin will be shipped to St. Louis, where refining equipment, now used for Monsanto's vanillin from guaiacol, will be enlarged and modified. Total cost at both locations is \$1.5 million.

Lignin will reportedly be barged from Bellingham, Wash., where Puget Sound Pulp & Timber Co. has a mill. Monsanto's construction at Seattle will start next month, will be completed early next year.

Corning Glass Works has some plans in the wind: It is shopping for a plant site in the Cortland, N. Y., area.

New products made news this week in San Francisco and Cleveland. Oronite Chemical Co. (San Francisco) is quietly pilot-planting a new nonionic detergent based on an alkyl phenol. A good deal of research data has been compiled, a few samples released for test.

Plasti-Kote Inc. (Cleveland) is readying a big sales campaign for Quick Foam, an aerosol detergent for household use (to clean upholstery, rugs, etc.). A \$1.49 can will clean a 9 x 12 rug.

Look for a surge in tripolyphosphates as new markets open: The sodium salt will have a millions-of-pounds market as a component of powdered household bleaches, which may well steal a third of hypochlorite sales; and the potassium salt is the strongest contender as a builder for liquid household detergents—also a large-tonnage outlet.

. . . The Editors

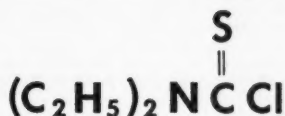
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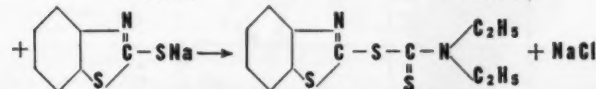
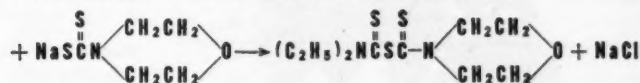
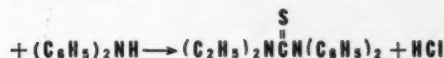
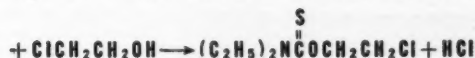
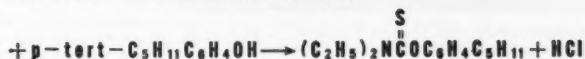
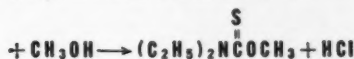
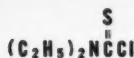


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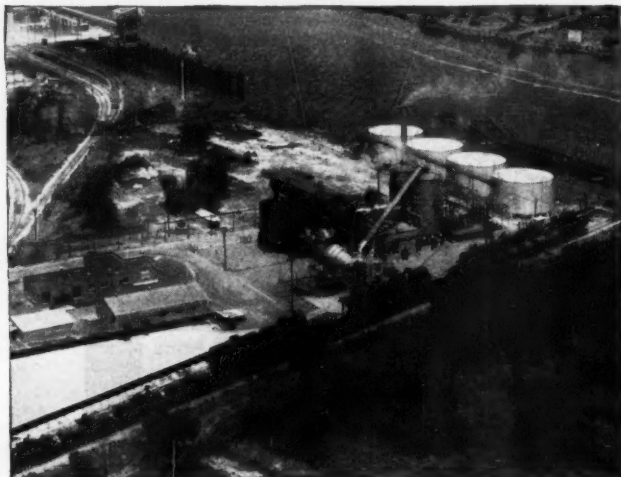
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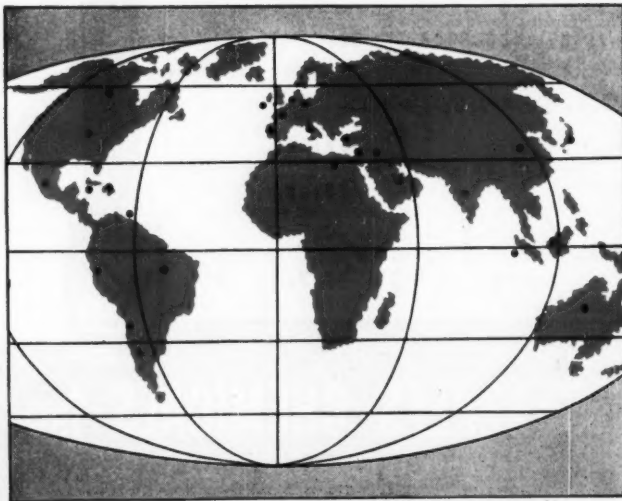
DESIGNS FOR MOBILIZATION PRODUCTION

On these pages, Monsanto presents three designs that may play a vital role in your production for mobilization. You may have the counsel of Monsanto engineers concerning these structures without cost and without obligating yourself or your company. For information, mail the coupon, wire or telephone **MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1703-D S. Second St., St. Louis 4, Missouri. Telephone MAin 4000.**

Use Monsanto's thirty years' experience in design and operation of sulfuric acid plants



MATHIESON CHEMICAL CORPORATION'S sulfuric acid plant at Pasadena, Texas, is built on a Monsanto design. (Photo courtesy Mathieson Chemical Corporation.)



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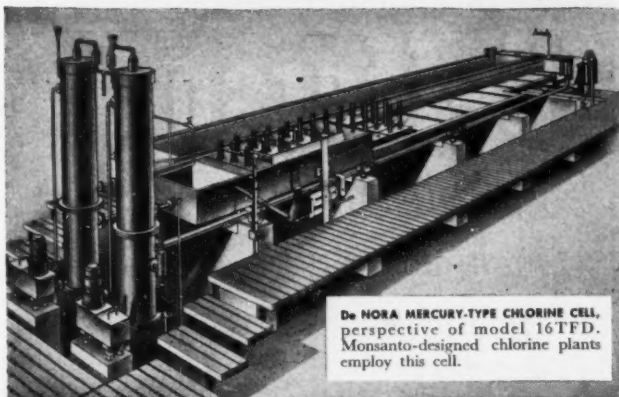
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You can make chlorine and caustic with this plant

If you're concerned with additional supplies of chlorine and caustic, contact Monsanto for details on manufacturing these products yourself . . . Monsanto offers you engineering service on the Monsanto Electrolytic Chlorine Process, which has these advantages:

1. In addition to producing chlorine of high purity, Monsanto-designed plants deliver rayon-grade caustic up to 73% without evaporators or purification . . . 2. All or part of the caustic production may be replaced by production of sodium sulfide or various other products . . . 3. The Monsanto process employs the De Nora mercury-type cell which has been used commercially for fourteen years. Of all mercury-type cells, this is the most rugged and compact. It requires a minimum of maintenance and a minimum of floor space.

Mail the coupon, or wire for complete information.

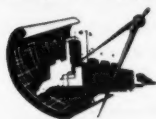


De NORA MERCURY-TYPE CHLORINE CELL, perspective of model 16TFD. Monsanto-designed chlorine plants employ this cell.

Refinery sludge recovery turns waste into useful products

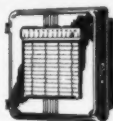


SLUDGE RECOVERY INSTALLATION—Combustion chamber and scrubbing tower (left), single decomposer unit (right), as added to an existing contact sulfuric acid plant (background).



EVEN HIGH-VISCOSUS SLUDGE can be processed in Monsanto-Ross-Wilde Unit by mixing it with more-fluid sludge.

VARIOUS TYPES OF SLUDGE, containing low or high concentrations of acid, can be processed in Monsanto-designed plants.



AUTOMATIC CONTROLS, incorporated directly into the package unit, reduce manual attention to a minimum in the Monsanto-Ross-Wilde installation.



WRITE FOR BOOKLET describing the Monsanto-Ross-Wilde process of sludge acid recovery.

You can make clean, high-grade sulfuric acid from most refinery sludge acids when you install a Monsanto-Ross-Wilde Sludge Recovery Unit. If H_2S is available, it can be used in the same equipment. In addition to the acid, which can be sold or used in your processes, the unit produces by-product steam for heat or power. In some cases, it recovers oil that can be refined into salable merchandise.

Thus you change refinery wastes into products that are worth money. You save the expense of disposing of sludge acid and H_2S . You improve your community relations by avoiding air and stream pollution.

The Monsanto-Ross-Wilde Sludge Recovery Unit will operate with your contact sulfuric acid plant, or, it can be erected with a Monsanto-designed sulfuric acid plant as a single project.

At your request, a Monsanto representative will be glad to visit your refinery, estimate the cost of a Monsanto-Ross-Wilde installation and show you how much you can save on disposal costs . . . how much you can realize from changing waste materials into useful products.

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CHEMICALS — PLASTICS

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Please send information on the following without cost or obligation:

- ☐ Sulfuric Acid Plants
- ☐ Chlorine Plants
- ☐ Refinery Sludge Acid Recovery Plants
- ☐ Booklet, "Monsanto-Ross-Wilde Process of Sludge Acid Recovery"
- ☐ Have a Monsanto representative call upon us.

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Briefs

From recent literature

Casting resins—employing diethylene glycol as a component, give light colored, tough, hard and resilient castings. These unsaturated polyester resins are hardened at relatively low temperatures. The castings may be machined and postformed into simple shapes at temperatures around 100° C.

Oil-in-water emulsions such as are sometimes encountered in petroleum production, have been resolved by treating the emulsions with a water dispersible product of the reaction of diethylene glycol with an aliphatic diacid or ester having at least eight carbon atoms in the chain.

Water-set printing inks are prepared by dissolving the product resulting from heating rosin with beta naphthol pitch in diethylene glycol and adding appropriate pigments. These inks exhibit good press stability, good flow and printing qualities, and are substantially non-corrosive. They set quickly upon the application of water.

Plasticizers are formed by reaction of essentially theoretical amounts of diethylene glycol bis (chloroformate) with thiophenol in the presence of a basic reagent. The product is a high-boiling, viscous liquid. It is found to be particularly effective as a plasticizer for synthetic rubber compositions, resins and plastics.

These developments are abstracted from recent publications or U. S. patents. The uses may suggest other applications of Jefferson Diethylene Glycol in your products or processes.

BUSINESS & INDUSTRY



AN EYE ON MALEIC OUTPUT: Consumers' demands write a . . .

Bigger Role for Maleic

Maleic moves into spotlight as phthalic and drying oils supplies lag behind needs. Advantage: reasonable availability.

Prospect for the next two years: more petroleum benzene and by-production from new phthalic capacity will stave off shortages.

Imminent development of larger-scale uses spurs higher output, will narrow maleic-phthalic price differential.

In the offing: a switch to butene and toluene feed stocks to free benzene for top-priority defense needs.

Since the firing in Korea began, supplies of quick-drying tung oil from China have dwindled until today they are only a trickle. To paint and lacquer manufacturers and their numerous customers, this situation would be far more aggravating were it not for the fact that maleic anhydride can upgrade the more abundant non-drying oils. This demand superimposed on many developing uses for maleic will tax producing facilities, but potential capacity for present needs is nearly adequate, except for

some periodic spot shortages.

The steady upward trend in maleic usage indicates that the shortages will become progressively worse by 1952 unless additional production is brought in. Although no definite plans have been verified for expansion, the supply-demand trend has caught the eye of several companies. Of course, knowing the demand is there is one thing; getting raw materials may be quite another.

Processes: A venture into maleic anhydride production is complicated

because three different raw materials are in use today: benzene, phthalic anhydride, and butenes. Besides these, toluene is a starting point of considerable promise.

In all these processes, the vaporized hydrocarbon is oxidized with air in the vapor phase using a vanadium pentoxide catalyst similar to the type used in phthalic anhydride manufacture. Because of the exothermic nature of the reaction, temperature control is a must, usually being maintained by circulating molten salt or mercury around the catalyst tubes.

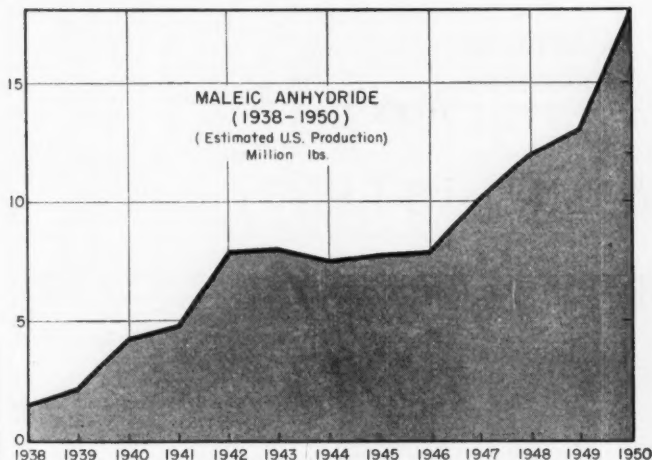
At the present time, approximately 35-40% of maleic is a by-product of phthalic manufacture, an equal amount from benzene, and around 20% from butenes. It is evident that the industrial destiny of maleic anhydride is closely tied up with phthalic in this state of affairs. Current heavy requirements for phthalic help maintain maleic output, but the converse could be unfortunate for maleic users at some future date.

From a technological standpoint, benzene is a most satisfactory raw material, but practical difficulties limit its use. First of all, the critical benzene shortage will be here for some time, with possible improvement in the latter half of 1952. When more becomes available from petroleum, the price will no longer be in the chemical bargain basement category.

Availability of supplies make butenes a more probable source for maleic expansion. In fact, further process improvements could eventually push the C_4 hydrocarbons into the leading role, although toluene looks feasible from the threefold aspects of supply, technology, and economics.

At this time, maleic-from-benzene is used by National Aniline and Reichhold; phthalic is the source for American Cyanamid, Monsanto, and Koppers; butenes have been utilized by Carbide and Carbon since 1948, after an earlier shutdown period.

Economics of Product: Since the first commercial operation in 1933, maleic anhydride production has in-



creased rapidly to the present annual rate of 20 million pounds, but this is still only about 10% of phthalic anhydride production. The difference in price between maleic and phthalic is around 15¢ a pound, maleic bring 35¢ and phthalic 20¢ at the plant in carlots. Large volume production of maleic will undoubtedly narrow this differential, but the higher price trend over phthalic will probably be maintained because of several inherent advantages, especially in alkyd resins.

End-Uses: Alkyd resins continue to provide the largest single outlet for maleic, but the fastest-growing use today is in low-pressure laminates. CIW estimates the end-use pattern for maleic today as follows:

| Use | Per Cent |
|--|------------|
| Synthetic Resins | 78 |
| Alkyd Resins | 60 |
| Modified alkyds | 10 |
| Copolymer Laminates | 8 |
| Chemical Intermediates (Fumaric, succinic, etc.) | 15 |
| Miscellaneous (Surface-active agents, antiseptics, etc.) | 7 |
| Total | 100 |

Prospects: For maleic producers, the future is well on the rosy side. It is true that material shortages will defer the realization of some of these prospects; but the intervening period until supplies become more abundant, will be marked by steady growth and commercial development of many new uses for this remarkably versatile chemical.

A greater trend toward the use of butenes and toluene is expected when new production is required. Best bet

for making new production necessary is the fast-growing styrene copolymer, glass fiber laminates now receiving plenty of attention for lightweight structural shapes of great strength. There are other challengers for this position among maleic derivatives including fumaric acid and wetting agents based on sulfosuccinic acid.

This all spells large-volume production at the earliest opportunity; and larger production in turn spells lower costs for many consuming industries.

Hushed Money

In the interests of national security, the Munitions Board has asked all military services that furnish information on their contract awards to omit the quantity purchased and the amount of the contract.

Published weekly by Commerce Dept., the information was a valuable source of information for potential sub-contractors. The trouble with the idea, say Munitions Board spokesmen, was that it also served as a valuable source of information for our potential enemies.

The action brought expected results: howls from business men all over the country (CIW, April 7). But before any action was taken, the whole idea was discussed with congressional small business committees and military agencies. And the consensus was that the omission was necessary even though it is contrary to the government's expressed desire to spread the base of contracting by giving contracts to more firms.

Commerce Secretary Sawyer, for one, is in favor of the omission. He says that most of the useful information to our prospective enemies is obtained, not through active espionage, but by carefully examining and collating official statements.

MRO Leaks Plugged

A rising torrent of orders is killing NPA's plan to have every kind of business issue its own DO for maintenance, repairs and operating supplies.

In the hope of saving at least parts of the plan, NPA is revising its regulation 4, which established the "Write your own DO" system for MRO supplies. But the revision will knock whole groups of products out of the MRO plan.

Scheduled to go are all kinds of chemicals except those used as catalysts, all paper products, containers no matter what they are made of, and wood and other forest products. The revision will also have a much more specific definition of what "operating supplies" are as contrasted to "production supplies."

Stampede: NPA was unprepared for the number of orders business let loose for MRO supplies, each bearing the DO-97 symbol allowed by regulation 4. Suppliers of products essential to defense industries have reported that their stocks are being swept clean by orders from non-defense business. The impact has been particularly heavy on steel products. And NPA is making a belated effort to try and police Regulation 4 by asking steel producers to report excessively large orders bearing the DO-OU label.

NPA officials are willing to admit the working of Regulation 4 is at fault. They also think many businesses have stretched the intent of the order in an effort to build inventories of production supplies in the guise of ordering MRO needs.

Chemicals will be taken out of the revised order when they leave the plant as part of the end product. And wood and paper products are expected to be dropped because it is hard to draw the line between operating and production uses.

Observers believe containers probably will be dropped on the theory that there is no use allowing unrestricted container-making when raw materials are being curtailed. NPA officials suspect that DO-97S for container materials is one of the loopholes being used to build up inventories of scarce supplies.



NAPA CHIEF JONES: "The law of supply and demand has not been repealed."

Now Chemical Buyers Must "Sell"

Government controls on critical materials place huge load on purchasing departments of chemical companies.

Purchasing association head tells CIW how his company (Du Pont) uses "specialized" buying to ease problem.

Claims P.A.'s must now "sell" suppliers on needs, have technical know-how to keep plants going.

This week, as government controls on defense materials continued to tighten, many chemical managements are reexamining the strength of their purchasing departments. Again, as in World War II, the ingenuity of the men who buy raw materials and

equipment has become a major determinant of a company's ability to produce the goods.

But chemical purchasing agents are fully aware of their critical role. Advance estimates of the expected attendance at the Annual Convention of

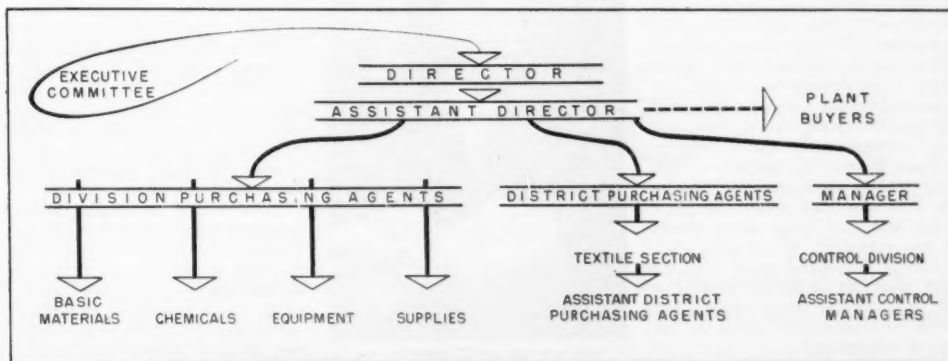
the National Association of Purchasing Agents (New York, June 4-6) show that the sessions on chemicals and allied products will have SRO signs hanging out. Equally significant is the fact that this year's president of the NAPA, Harold Jones, is from the chemical industry . . . he's a purchasing executive of Du Pont.

Jones, who is on a special defense materials assignment for his company, interrupted his busy schedule last week to grant CHEMICAL INDUSTRIES WEEK an exclusive interview. And he took the opportunity to blast a lot of mistaken impressions about purchasing agents.

P.A.'s sell: In the first place, Jones points out, modern purchasing has no place for the grouch with a vocabulary of one word, "no." The modern P.A., especially in days of material shortages, must be one of the top "salesmen" of his firm.

To prove his point Jones quoted from the National Association of Manufacturers' definition of the P.A.: ". . . must have ability to deal easily with people, but to make firm business decisions without arousing antagonism or losing friendships. Has extraordinary knowledge of industry . . . and a formal or practical training in economics and engineering (or other science applicable to the particular industry)." All of which, says Jones, "sounds like the 'specs' for sales engineer . . . doesn't it?"

Actually, the NAPA president contends, salesmen and purchasing agents are basically the same kind of people . . . "they merely sit on opposite sides of the same desk." Even their professional organizations are similar, Jones explains. The Federation of Sales Executive Clubs is an organization of some 90 local clubs in as



DU PONT'S BUYING SETUP: Direct line to top policy-making; specialized buying provides strong base.

many cities throughout the country and with a total membership of 15,000. NAPA is composed of 86 local associations throughout the United States and Canada with a membership of approximately 13,000.

Technical P.A.'s: Jones is firmly convinced that modern industrial purchasing has a great need for technical know-how and therefore technical men. He explains that an estimated 40 per cent of major purchasing posts are now held by men with engineering experience. "This figure will continue to grow," he adds, "because of the increased complexity of equipment and raw materials buying. Only the P.A. who has a sound knowledge of his company's production processes can buy sensibly."

Specialists: Du Pont learned some time ago the value of specializing areas of purchasing . . . and getting specialists to do the actual buying. Insofar as possible, the company endeavors to match a man's buying list with his formal training and experience. Under this plan, every attempt is made to have mechanical engineers do the buying of equipment, electrical engineers, the buying of instruments, and chemical engineers, the buying of raw materials and chemical intermediates.

Du Pont Set-up: In the Du Pont organization, the Director of Purchasing is responsible directly to the Executive Committee of the company. This in itself, Jones believes, shows the importance with which the purchasing function is viewed by many chemical managements.

Under an Assistant Director there is a horizontal breakdown of major buying areas such as basic raw materials, chemicals equipment, etc. These "divisions" are headed by Division Purchasing Agents. Assistant Division Purchasing agents under them lead buying sub-groups which specialize in the procurement of definite "families" of raw materials or types of equipment and services. A Control Division handles the bulk of the paper-work such as invoice checking, contract control and expediting.

Plant Buyers: In addition to this large central purchasing staff of 250, Du Pont maintains about 180 plant buyers stationed in the various plants of the company. These men, buy numerous "bread and butter" items to keep their plants going. They also buy some of the heavy staples, but under a control system set up by the central organization.

No Lost Motion: The NPA president claims that the practice of match-



HAROLD JONES: "About 40% of the major purchasing posts are currently held by men with engineering experience. . . .

ing men with the materials they buy has worked to obviate a lot of waste motion in procurement at his company. And it is especially valuable, he adds, in times of critical materials situations, such as we have now. The trained P.A., as World War II showed, is in the position of being able to recommend sound substitutes when the needed material is unavailable.

In purchasing, as other fields, there is no substitute for experience.

"Specifications are necessary and helpful to the P.A.," says Jones, "but there is nothing like having a 'feel' for the product you're buying . . . that's the difference between buying and purchasing."



. . . and this figure will grow because of the increased complexity of modern equipment and raw material buying."

How Safe is Safe?

A decision in the U.S. Sixth District Court (in Cleveland) may provide part of the answer to a question vitally important to the chemical industry. The decision: Brush Beryllium Co. must again stand trial for the alleged poisoning of a non-worker. The question: How far must a chemical company go in protecting lives and property in surrounding communities.

The recent decision (upholding a previous one by a common pleas judge) came as a climactic development in the year-old case that had its start in the death of a newspaper dealer. His widow and 2 children had promptly started a suit for \$125,000—alleging the cause of death as fumes from beryllium compounds emanating from the Brush Beryllium-operated AEC plant in Lorain, Ohio.

Trial: At the trial, a squad of AEC experts and medical authorities were brought in to testify. One thing the experts agree on with regard to beryllium—toxicity is not confined to the metal itself. Compounds formed in extracting it, from the ore may be equally dangerous.

Attorney for the plaintiff presented an array of evidence trying to prove that the peddler had lost his life as a result of inhaling the fumes.

The lawyers also contended that between 1941 and 1946, the company had employed no more than 200 people at any one time. And during that period, Brush had 179 cases of compensable illness, and 3 deaths which were diagnosed as beryllium poisoning.

Brush admitted that prior to 1947, it had discharged dust and fumes from the plant through louvered windows and small roof-level stacks. Only after a visit of AEC engineers, was the "high" stack on the roof of the plant brought into general use.

One of the main lines of the company's defense was in demonstrating the concern it had showed for the welfare of people in the community inside and outside the plant. For instance, it gave evidence that it had sent medical experts to various universities to determine the best methods for safe handling of products.

Since the jury was unable to reach a verdict, defense attorneys demanded a directed verdict in their favor. But the demand was rejected all the way up the line. And once again the eyes of the chemical industry focus on the beryllium case and the decision which may ultimately answer the question . . . how far must a chemical company go in safeguarding lives and property.

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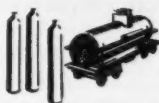
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- Lubricating Oil Additives
- Cresylic Acids
- Gas Odorants
- Sodium Sulfonates
- Purified Sulfonate
- Naphthenic Acids
- Phthalic Anhydride
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- Para Xylene
- Xylol
- Aliphatic Acid
- Hydroformer Catalyst

Here are 3 major uses for Oronite Polybutenes

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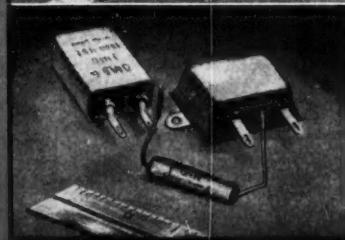
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Cominco - 2 in 1

This week, Cominco (Consolidated Mining and Smelting Co. of Canada, Ltd.) is celebrating 20 years as a member of the chemical fraternity. Primarily a producer of base metals, the company is a good example of the economies that can be attained through integrated chemicals and metallurgical production.

Cominco's new ammonia phosphate plant gives ample indication that the chemical operations are not a sideline. Scheduled for production late next year the plant (with a rated capacity of 70,000 tons a year) will push the company's overall fertilizer production to an impressive 630,000 tons annually.

Integration: But the plant does emphasize the extent to which Cominco has integrated its chemical and metallurgical operations; the source of sulfuric acid for the phosphate production will be metallic sulfides from the Sullivan mines—raw material for lead and zinc concentrates.

Sulfur, in fact, was the original reason for Cominco's entry into the chemical and fertilizer field in 1931. As the size of the metals capacity increased, disposal of sulfur posed a knotty problem. The decision to produce fertilizer was reached after an investigation showed that the sulfur could be most profitably utilized in the form of sulfuric acid as an intermediate for fertilizer. At present, the company utilizes "waste" sulfur to turn out 1,100 tons of 100% sulfuric acid a day at the Trail plant.

Another illustration of integration is the utilization of waste heat from the metals plants to produce process steam for chemical reactions. And the condensate is electrolyzed to make hydrogen for the ammonia plant.

The advantages work both ways, too. Fluorine, for instance, recovered from phosphate rock, is used to manufacture hydrofluosilicic acid—an electrolyte for the lead refinery.

Fertilizer Production: In addition to the sulfuric acid, the Trail plant turns out 400 tons of ammonia daily. With these raw materials, and phosphate rock, Trail produces ammonium nitrate (300 tons a day), ammonium sulphate (450 tons), and ammonium phosphate (500 tons). Another plant (at Calgary) produces 240 tons of ammonia per day.* Part of this goes toward production of ammonium nitrate there—the rest is shipped to Trail.

* Often cited as one of the world's lowest cost producers.



PHOSPHATE AT TRAIL: Bulldozer atop raw material for fertilizer and lead.

Its fertilizer production, coupled with its metal capacity (chiefly 300,000 tons of lead and zinc, and 8 million oz. of silver) form the basis for the company's suggestion . . . that it's "probably the biggest operation of its kind in the world."

EXPANSION. . .

Du Pont: Increasing demands for dyeing and printing of cotton, wool, and synthetic fibers has moved Du Pont to expand manufacturing facilities for Ponsol dyes at its Deepwater Point, N. J., plant. No new construction will be involved; present plant will be expanded and modernized. The project will cost \$1 million; production is slated for early 1952.

Sinclair: The company reportedly will spend \$75 million on refinery expansion at Houston for aviation gasoline and components. Only 75% of cost will be eligible for write-off within 5 years.

International Paper Co.: Expansion of the Southern Kraft Division's dissolving pulp mill at Natchez, Miss., is scheduled for completion sometime in 1952. Present capacity is about 300 tons per day, new facilities will double that figure.

TVA: Ten more small timber treating plants are under construction in the Tennessee Valley. TVA says that prior to its series of post treating demon-

strations, no facilities in the valley were available for the chemical treatment of construction timber or fence posts. At present, there are 27 timber treating plants—8 commercial, 10 community, and 9 farm plants.

Heyden: The Department of Defense has delivered to Heyden Chemical Corp. a draft for the reactivation of the Morgantown Ordnance Works. If the draft is satisfactory, Heyden will go ahead with the project. The government is close-mouthed about timetables, but Army officials say that contract negotiations are proceeding as scheduled.

GSA: The General Services Administration has begun negotiations for the commercial operation of the government owned aluminum forgings plant at Erie, Pa. A number of firms have submitted proposals for leasing the plant; it was operated by Aluminum Forgings Inc. during World War II.

International Minerals & Chemical: Construction on a new plant near Mulberry, in Polk county (Florida) will get underway immediately. The new plant will produce feed grade defluorinated phosphate, triple superphosphate, and uranium as a by-product. The phosphate will be supplied from the company's adjacent mines; production (rated at 100,000 tons of defluorinated phosphate annually) is scheduled to start in the spring of 1952. President Louis Ware says plant will use a new processes believed to be an improvement over existing ones.



LITTLE MIKE MORSE likes his farina. And his father, Monsanto's food technologist Roy E. Morse, sees to it that Mike's and 21 million other youngsters' farina is properly fortified with vital minerals.

How Chemists Safeguard Your Food

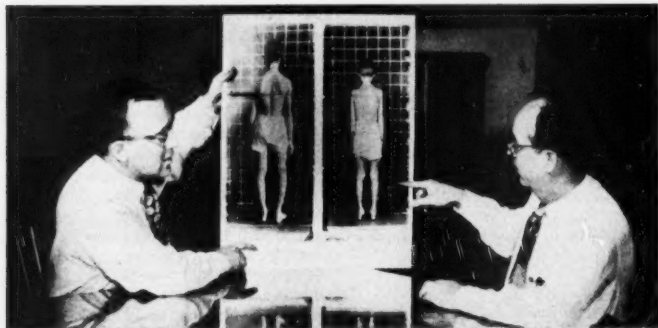
Close quality control—to make sure that products live up to specifications—is mandatory in any chemical manufacturing. But when a product finds its way into food products, watchfulness must be doubled and redoubled.

Typical of a chemical company's operations in the food field is Monsanto Chemical Co.'s development of an enrichment supplement for farina, at Anniston, Ala., where the CIW Camera visited this week.

The product adds minerals—iron, calcium and phosphorus—in the form of sodium, iron and calcium phosphates. The

materials, obviously, must be pure, easily assimilable, and readily blended with the food product.

Not to be overlooked is the close, hand-in-hand cooperation between industry and government in safeguarding the nation's health. The Food and Drug Administration, drawing on its own knowledge as well as the best scientific advice available, sets up minimum standards for various foods. Industry, using such facilities as those at Monsanto's Food Technology Laboratory, not only see that those standards are met, but also develop tastier, more nutritious products.



RESULTS OF MALNUTRITION, shown graphically in photographs made by the University of Alabama, are studied by Morse and group leader Theodore W. Schilb.



FEDERAL REGISTER, which Morse is checking, publishes FDA's food standards.



PROPER BALANCE of fortifying ingredients is determined in staff meeting with assistant research director H. V. Moss.



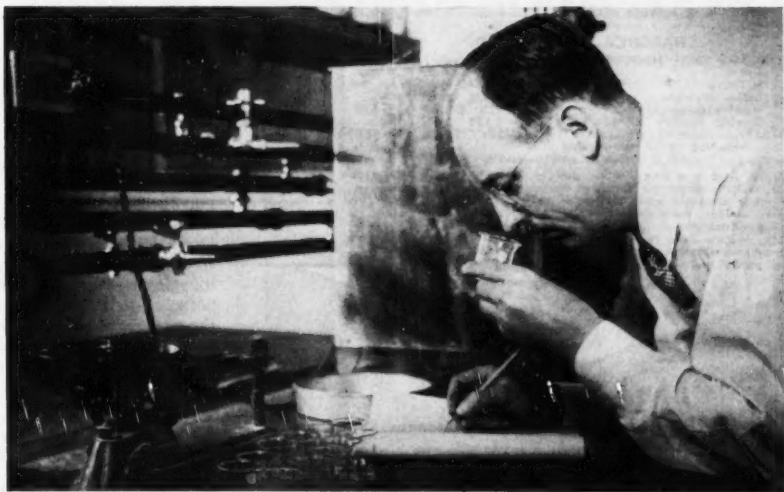
TOTAL SUPPLEMENT, pointed out by Morse (center), is made up of sodium, iron and calcium phosphates on glasses at right.



TRICK IN MANUFACTURE of phosphates is to get proper particle size for good blending.



OVEN TEST determines how long enriched farina will retain its goodness. One day here is equivalent to 1½ months on the shelf.



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|---|-------------|
| Sebacic Acid $\text{HOOC}-(\text{CH}_2)_{10}-\text{COOH}$ | 98% min. |
| Ash | 0.10% max. |
| Moisture | 0.15% max. |
| Iodine Number | 0.4% max. |
| Melting Point | 129° C min. |
| Specific Gravity 25°/15° C | 1.110 |
| APHA Color—2 grams dissolved in 50 ml. alcohol | 80 max. |
| (C. P. grade is also available) | |

Sebacic Acid is a free flowing powder, white in color, with a high melting point. Its chemical reactions are similar to those of other aliphatic acids and it is easily converted to esters, salts, amides, ester-amides, acid chlorides and many other useful derivatives.

USES: Widely used in Plasticizers, Alkyd Resins, Fibres, Paint Products and other applications where its high heat stability and purity are of great advantage.

Write for further information



HARDESTY CHEMICAL CO., INC.

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FOREIGN

Egypt: A technical committee has been formed to study the final details for building a DDT plant in Egypt. Under the chairmanship of the Assistant Undersecretary for Industries, the committee will be made up of a German expert and Egyptian authorities on the chemical industry.

The Minister of Commerce and Industry has taken a personal interest in the project and has urged a speedy execution of plans in view of the high cost of important DDT. Another factor that argues for early construction is that a large part of the required raw materials are locally available.

PEOPLE

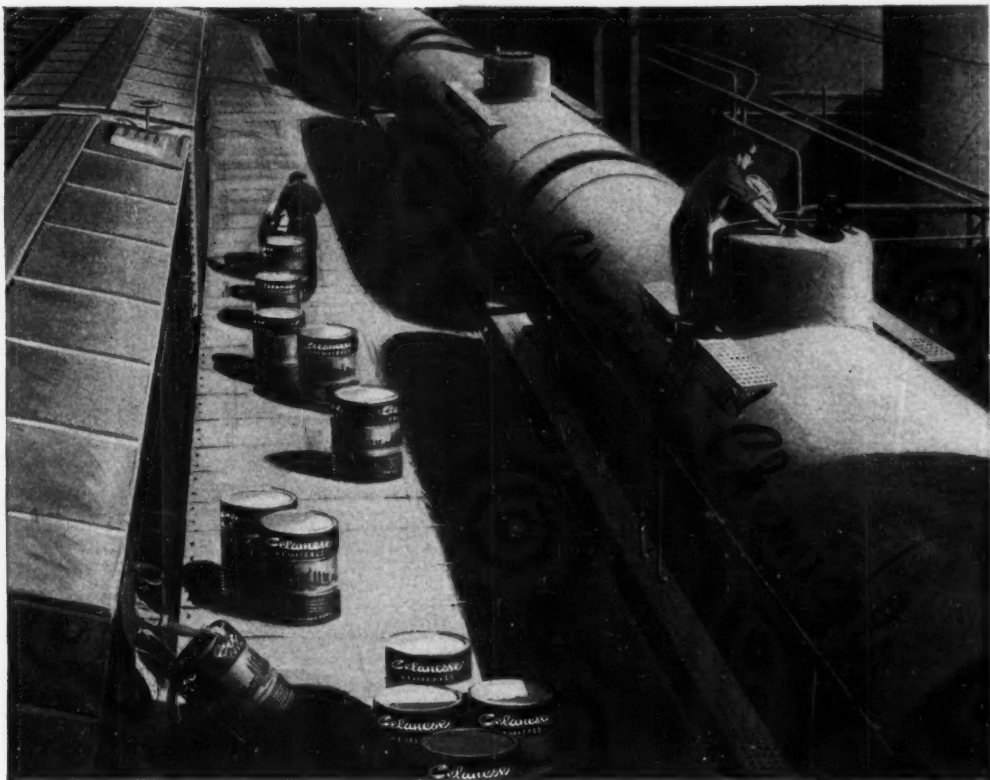


Vincent Anywell, production manager for Celanese at its Bishop (Texas) plant will be the new plant manager.

In another new appointment at Celanese, J. Gordon Mitchell of the Cumberland (Md.) plant will be manager of the new Edmonton plant.

•
Dow: Five men will shortly assume duties as divisional managers in connection with Dow's new atomic energy project in Colorado. The five: Dr. William H. Beamer, Dr. Lewis R. Drake, Burchard P. Shepherd, Wilfred M. Bean and John W. Stram. Although construction of the plant will not start until the latter part of May, the men are already working on problems relating to the program under F. H. Langell (plant Manager) and Dr. L. A. Matheson (technical director).

•
Walter E. Murray, former vice president and general manager for Warwick Chemical will be the new president of Crown Chemical Corp. in Providence, R. I.



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Everywhere the Celanese trademark appears . . . on tank cars lined up along railroad sidings . . . on drums stacked on plant receiving platforms . . . everywhere, it's a symbol of intensified industrial activity as more and more industries look to Celanese for volume shipments of organic chemicals.

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assistance based on a generation of experience in petroleum chemistry—assurance to industry of large-scale uninterrupted production.

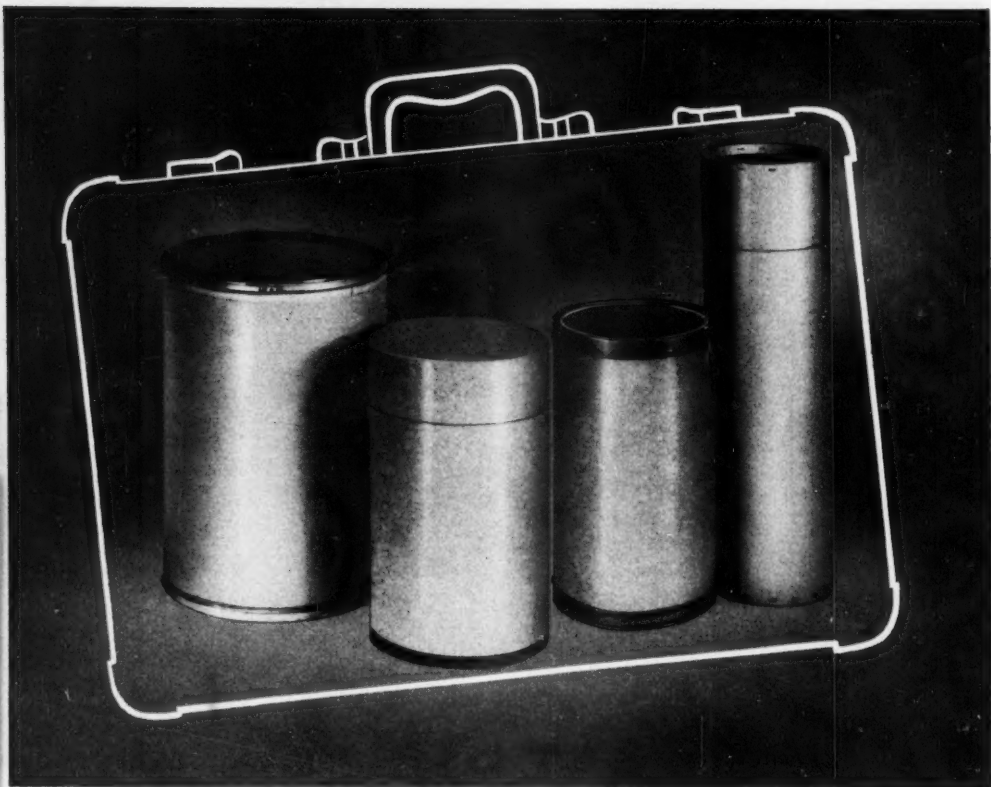
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Write now for the revised technical manual on Formaldehyde—37 pages of detailed information, including a special 4-page section on Formcelt (Formaldehyde—alcohol solutions). Celanese Corporation of America, Chemical Division, Dept 502-D, 180 Madison Avenue, New York 16, N. Y.



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WILLIAM F. MEGGERS: His mercury 198 is 300% better than cadmium.

Mercury: A Better Yardstick

Newest and most accurate standard of length known to science is based on an artificial isotope of mercury.

Production and distribution of spectroscopic lamps containing mercury 198, by the Bureau of Standards...

Will, for the first time, provide industrial research organizations with an ultimate primary standard of length.

Although two lines on a platinum bar still mark the world's official standard of length, characteristic wavelengths of light have long been the choice of the precision-conscious physical scientist. For practical purposes, light is produced by excitation of chemical elements in the vapor phase; wavelengths are determined by the structure of the atom under excitation.

Measurement of length in terms of light radiation involves the optical technique of interferometry. In this procedure the number of light waves contained between two optically flat plates is established from an interference pattern. If the distance between the plates is known, the length of a wave may be calculated. Accuracy of the method depends upon the degree of definition of the wavelength used.

Predicted in 1931: Until the advent of the new isotope, the wavelength of red light in the spectrum of cadmium was the standard. But, as long

ago as 1931, Dr. W. F. Meggers, Chief of the Bureau of Standards Spectroscopy Laboratory, predicted that a super-accurate standard of length was attainable if one of the even-atomic-weight isotopes of mercury could be isolated from the seven which comprise the element. His reason: wavelengths of light from pure isotopes of even atomic weights are ultra-sharply defined, permitting great accuracy of measurement.

Availability of the pure mercury isotope marked time until the arrival of the atomic energy program. In 1945, the first significant quantity of artificial mercury 198 was produced at Oak Ridge by intense neutron bombardment of gold.

Cadmium Out: Mercury 198 is head and shoulders above its cadmium predecessor. The dethroned cadmium standard consists of 6 principal isotopes—each emitting light of slightly different wavelength. As a result, a region of optical confusion is pro-

duced, limiting the accuracy of measurement. Mercury atoms are heavier, move slower, and consequently produce less disturbance. Moreover, they can be excited at lower temperatures, further braking speed of atomic motion.

The new standard is based on the wavelength of the green line in the emission spectrum of the isotope. This wavelength, about 21 millionths of an inch, is consistently detectable with a reproducibility greater than 1 part in a billion. Length measurements can readily be made with an accuracy of 1 part in 100 million—300% better than cadmium—and new apparatus now in the works at the Bureau is expected to increase this to 1 part per billion.

Pure mercury 198 supplied to NBS by the Atomic Energy Commission is incorporated into spectroscopic lamps for laboratory use. Designated NBS-Meggers Mercury 198 Lamps, they contain about 1 mg. of the isotope sealed in a small glass tube. Excitation is by high-frequency radio waves. Lamp-life appears to be infinite; a lamp under continuous excitation since October 1949—over 10,000 hours—is still going strong.

Industry Will Gain: Aside from its research value, the new standard may have considerable significance from a practical industrial viewpoint. High-precision gauges and measuring instruments, indispensable members of the mass-production team, are only as good as the standards from which they are made.

More On Hydrazine: Large-scale production of hydrazine—if, and when it becomes fact—should boost commercial development of many related substances. Guanazoles are prime candidates. These obscure compounds, useful in the manufacture of various light-colored, water-resistant plastics, are characterized by marked process time-savings. Price (tied to hydrazine's) has been the major obstacle to widespread application.

Hydantoin Lubricants: New patent assigned to Publicker Industries describes preparation of a novel class of textile lubricants and softeners. Hydantoin long chain amine reaction products represent the group which imparts a soft, drapy effect to fabrics. Other features are good alkali and washing resistance and no harmful effect on the fastness or light-resistance of direct dyes.

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Novel Brominator

First commercial production of N-bromoacetamide (NBA) marks the general availability of a peculiar, but highly useful synthetic tool. Its special ability to perform specific brominations has a wide potential market.

This was conclusively demonstrated by the commercial success of related N-bromosuccinimide (NBS). These N-halogenated compounds' chief claim to fame is their utter contempt for the rules of classic organic chemistry. They will substitute bromine on an allyl carbon atom without adding to the adjacent double-bond. For example, NBA and NBS convert 1-butene to 3-bromo-1-butene with the greatest of ease.

Sterol chemists have made capital of this faculty for the introduction of olefinic bonds in special side-chain positions; formerly a task bordering on the impossible. Cortisone synthesis benefited in no small way.

In addition to its novel brominating prowess, NBA oxidizes secondary alcohols to ketones and adds Br₂ and HO Br to double bonds under proper conditions. Nearly quantitative yields are not uncommon for bromine additions using NBA.

Despite the earlier commercial debut of NBS, NBA was the first compound used for brominating methylene groups adjacent to double bonds. Until now it never progressed further than the laboratory, because of poor preparatory methods. Arapahoe Chemicals, Inc. of Boulder, Colo., has apparently overcome this obstacle and now produces NBA in quantity.

The new product is a white powder containing about 58% active bromine. Stability is good if stored at moderate temperatures in tightly closed containers.

Glowing Plastic: Two new phosphorescent pigments for use in plastics are now in commercial production by Rhode Island Laboratories, West Warwick, R.I. Violite Blue 8-60 emits blue light with an afterglow of 8-10 hours; its companion Violite Light Blue 18-50, has a light blue emission and an afterglow of 8-12 hours.

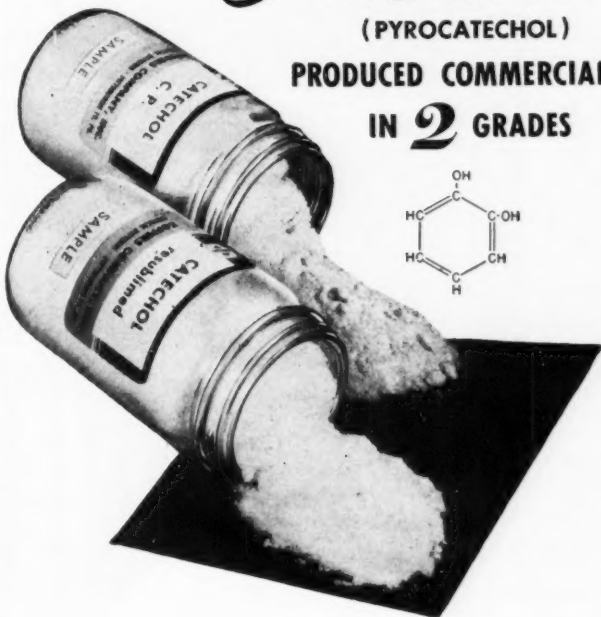
Both pigments have a grayish-white daylight color and respond quickly to any exciting light source. Compatible with a wide variety of monomers, they are particularly suitable for thermoplastic resins such as acrylic, styrene, vinyl acetate, and polyvinyl chloride (and copolymer). Further evaluation is now in progress.

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- Koppers Chemical Division makes this industrially important chemical in two commercial grades—C.P., with a minimum purity of 99.0%, and Resublimed, with a minimum purity of 99.6%.

Catechol currently has a wide range of important applications—in preparation of dyestuffs and medicinals, in photography as an oxygen-removal agent, in specialty inks and in the production of antioxidants for rubber and lubricating oils.

Resublimed Catechol is largely used for medicinal, pharmaceutical and photographic purposes, while the C.P. grade is usually suitable for most other chemical manufacturing and processing.

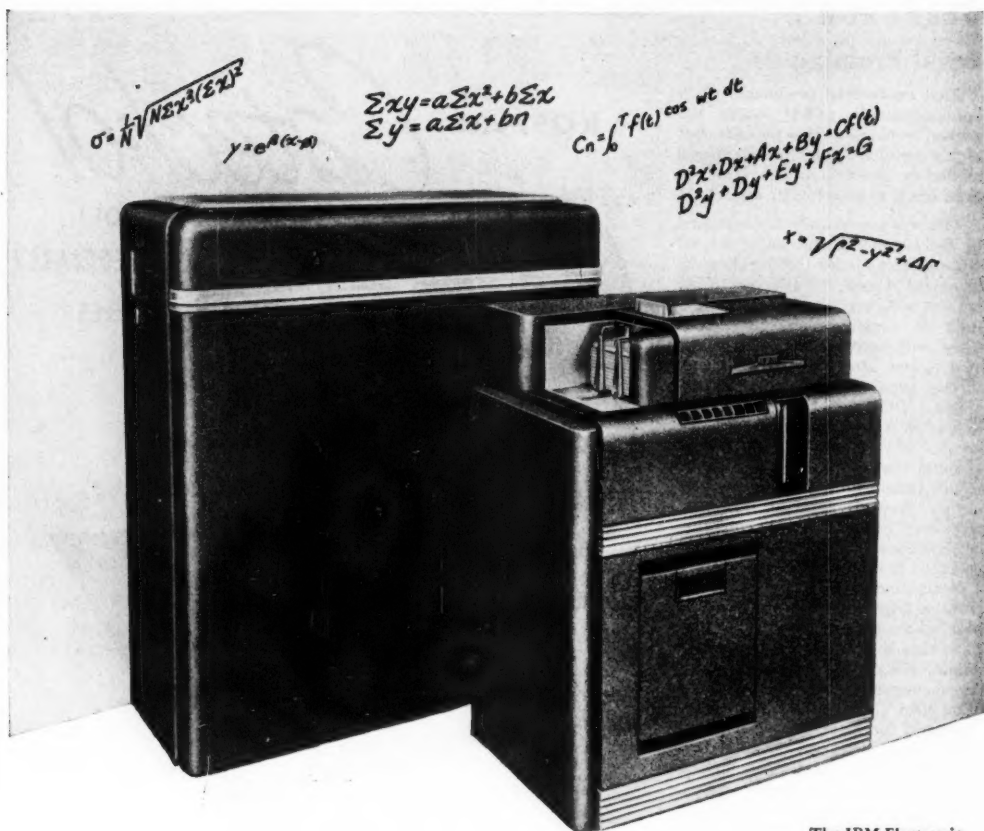
FOR FURTHER INFORMATION—write for your copy of Bulletin C-9-127. It contains full details on the properties, uses and reactions of Catechol.

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The IBM Technical Computing Bureau, located in New York City, is staffed by trained industrial mathematicians and provides a dependable, rapid, economical, and confidential service. Inquiries are invited and will receive prompt attention.

INTERNATIONAL BUSINESS MACHINES CORPORATION
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RESEARCH

Fluorescent Cotton: Two years of joint research by the Aberfoyle Manufacturing Co. and Switzer Bros. have paid off with the first successful application of daylight fluorescent dyes to mercerized cotton. Researchers at 3 Aberfoyle plants frequently worked 2 shifts to accomplish the unprecedented feat.

Although the identity of the new dye is a close secret, the collaborators admit that the finished yarn is altered resulting in a completely different chemical structure. Yarn has come through the pilot-plant and is now in limited production. Commercialization has not yet begun.

Slime Controller: Monsanto's sodium trichlorophenate is now making its bid in a slime-control market populated by chlorine, copper sulfate, quaternaries, hypochlorites, etc. The product, called Santophen 45, is now obtainable in research quantities. Primarily intended for industrial cooling waters, the material has proved effective against bacteria and algae in laboratory tests and field trials.

Headache Aid: Newest threat to the 12 million pound-a-year aspirin market is salicylamide. Although chemically related to aspirin, the compound is reported to have 7 times the analgesic potency and none of the discomforting gastric after-effects. Chemo Puro Manufacturing Corp. produces the product for pharmaceutical use.

Enzyme Reagent: Glucose-6-phosphate, a valuable reagent for the study of enzymatic reactions in carbohydrate metabolism, is now available from Schwarz Laboratories, Inc. in the form of its barium salt. The material is but one of a group of phosphorylated sugars offered by the company for enzyme studies.

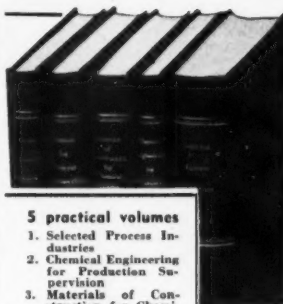
Stearic Powders: All grades of Emery Industries, Inc.'s stearic acids are now available in extra-fine powders. Screen tests on the new powders show that 95% pass through a No. 100 sieve (0.0059 inch opening); only 70% of previously available powders could get through the same sieve.

Amino Acid: Nutritional research organizations may obtain synthetic dl-ornithine hydrochloride of better than 99% assay from Mann Fine Chemicals. Supplies of the hard-to-get amino acid are limited.

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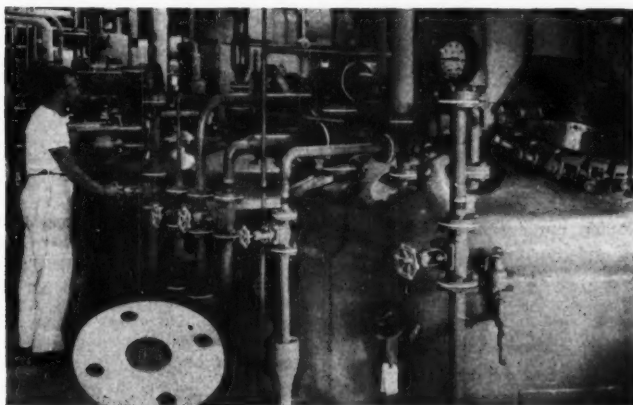
The men who buy soda ash know Wyandotte . . . know Wyandotte is dependable. Vast company-owned resources of coal, salt and limestone make Wyandotte a source of supply you can depend on. And manufacturing controls make Wyandotte Soda Ash a product you can depend on. For on-time deliveries, for a uniform product, you can depend on Wyandotte.

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PRODUCTION



FLUOROPLASTIC GASKETS: Fewer shutdowns, more output.

Target: Continuous Operation

Industry is turning to fluoroplastics for gaskets and packings to boost production, slash costs by paring shutdown time, save on maintenance labor.

On the horizon: broader use of fluoroplastic suspensoids to coat or impregnate materials for added corrosion resistance.

Today, operation of process equipment at 100% of capacity, or higher, is absolutely essential. The desired "... or higher ..." factor in many cases can be provided by replacement of standard packing or gasketing materials with those fabricated from one of the "noble plastics"—Teflon (polytetrafluoroethylene) or Kel-F (polytrifluoromonoethoxyethylene).

Cost: Although high in first cost (\$5 per pound for unfabricated Teflon and \$12-13 per pound for Kel-F), fluoroplastics are inexpensive for many uses. The increased adoption of continuous processing of highly corrosive materials has placed a premium on continuous operation of process equipment. It does not take much equipment down time and costly labor for gasket replacement to equal the cost of a small gasket. But extremely high resistance to corrosion and high temperature are needed if this saving is to be made. And these are the major virtues of the fluoroplastics.

Gasket and packing manufacturers have not been slow to capitalize on these properties. Practically all have added fluoroplastic gaskets and pack-

ings to their line of materials.

Further evidence of the acceptance of these new products is provided by the fact that Du Pont's new Teflon plant at Parkersburg, W. Va., brought into operation in the first part of 1950, cannot supply the demands of the armed forces and industry. A similar situation exists for Kel-F. Further, one fluoroplastics producer is now planning to expand production.

Properties: The "noble plastics" are almost completely inert to chemical attack, extremely resistant to heat and to embrittlement caused by low temperatures, and they have a very low coefficient of friction. This latter property is of the greatest importance where the plastic is to be used as packing around a rotating member, e.g., a valve or centrifugal pump. No lubricant is required.

This combination of properties is so unique that use of fluoroplastic packing and gasketing materials has rescued several processes from oblivion. Designers and operators of anhydrous hydrogen fluoride-catalyzed alkylation plants, erected during World War II, would have been saved hours of grief and lost production time if Teflon or

Kel-F had been available. They were not, so the costly and generally unsatisfactory procedure of continuously pumping in hydrocarbon ahead of all packing glands to prevent their contact with the hydrogen fluoride in the rest of the system had to be used.

Fabrication: Kel-F is priced at \$12-13 per pound for the molding powder whereas Teflon is about \$5 per pound for unfabricated shapes. But Teflon cannot be molded. The powder must be sintered to form a shape, such as a bar, and then machined to the exact size. Kel-F is a true thermoplastic and can be molded directly on high-temperature molding equipment or machined to size. Because Teflon scrap cannot be recovered, the higher cost Kel-F will often be less expensive in its final form.

Kel-F has two major disadvantages. It has a lower softening temperature than Teflon and its higher coefficient of friction increases the power consumed by the packing as in centrifugal pump operation. This difficulty can be overcome by plasticizing the Kel-F but reduces the maximum temperature at which the plastic part can be employed as well as adding another material to the system.

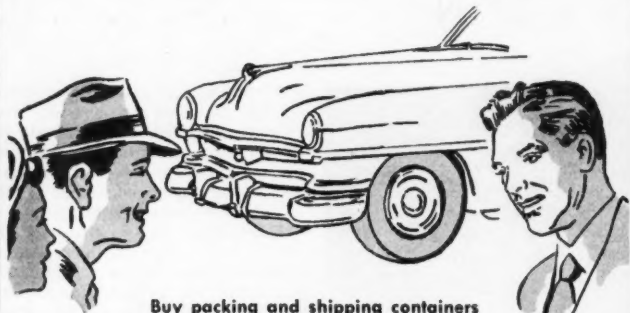
Suspensoids: Kel-F and Teflon are available as suspensoids. In this form they can be used for impregnation or for coating purposes. For example, asbestos packing impregnated with Teflon has nearly the same resistance to corrosion as Teflon but costs much less. However, it is not as resistant to abrasion as Teflon itself.

The suspensoid can be used as a coating material either by dipping or flowing it onto the surface to be coated, drying and baking at elevated temperatures. Some difficulty, however, has been experienced in getting the film to adhere to the surface being coated.

Products: Materials fabricated from

| NOBLE PLASTICS | | |
|-----------------------------|---|----------|
| | Kel-F | Teflon |
| Maximum Service Temperature | 390 F | 500 F |
| Minimum Service Temperature | —330 F | —320 F |
| Corrosion Resistance | Attacked only by molten caustic soda, molten sodium, or fluorine. | |
| Moisture Absorption | 0 | 0 |
| Coefficient of Friction | —* | Very low |

*Higher than Teflon. Can be reduced with plasticizer which also reduces maximum service temperature to 300 F.



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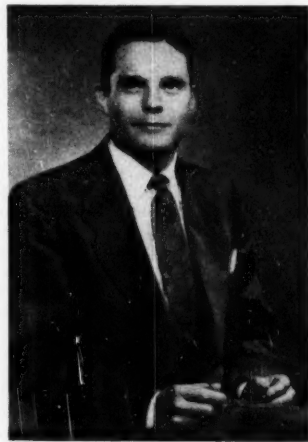
PRODUCTION

fluoroplastics range from simple gaskets to piston rings and bellows-type expansion joints. The manufacturer of the latter, United States Gasket Co., states that a Teflon expansion joint costs approximately the same as a stainless steel expansion joint. But it is not recommended for operation at pressures over 25 psi at temperatures above 550 F. Fluoroplastics are also being used as valve seats because of their excellent resistance to abrasion.

Outlook: The increasing use of continuous processing places an ever higher price on equipment down time. Result: a continually expanding demand for fluoroplastic parts. The unit price for these parts, however, will always be high unless a new, inexpensive source of hydrogen fluoride can be developed.

Spinning Evaporator

Available from Switzerland for some time, the Luwa-Müller evaporator will now be sold in the United States by Rodney Hunt Machine Co. In use in Europe and Canada for concentrating milk, fruit juices and solutions of pharmaceuticals, the Luwa-Müller evaporator is particularly adapted to concentrating heat-sensitive materials. The new evaporator is a single vertical steam-jacketed tube surrounding a finned rotor. As a film of the liquid to be evaporated flows down the tube wall, fins on the spinning rotor—the rotor fins barely clear the tube walls—agitate the film of liquid, greatly increasing the rate of heat transfer. This, together with reduced pressure inside



ARNE GUDHEIM: Agitate for higher heat transfer.

Chemical Industries Week

the evaporator tube, provides a high rate of evaporation.

Arne Gudheim of Rodney Hunt, tells CIW that the largest unit to be produced will evaporate 2,500 pounds of water per hour from a single tube with an inside diameter of 30" and a length of 18'. The first cost will be about the same as for a standard single-effect evaporator of equivalent capacity. Maintenance cost will be somewhat higher than for a standard multitube evaporator.

Fruit Juices and Glycerides: The liquid to be concentrated is at temperature for only a few seconds; thus decomposition of heat-sensitive products, such as fruit juices or milk, is minimized. According to Gudheim, another potential application is as a reactor where removal of a small quantity of a volatile material will force a reaction to completion. Example: preparation of monoglycerides by the esterification of glycerine and a fatty acid.

Defoamer: Foaming, which accompanies many evaporations, is reduced by a series of fins in the upper section of the evaporator which surround the rotor. The centrifugal action of the rotor throws entrained material against the surfaces of the separator from which it falls back into the evaporator.

Paper Production Lab: Crown-Zellerbach Corp. is building a miniature paper mill at its Camas, Wash., plant. The laboratory will enable the company to remove experimental operations from producing units. It will include experimental facilities for pulping, refining, bleaching and paper production.

Pocket-Size pH Meter: No longer is it necessary to grab samples and send them to the laboratory to determine pH. Analytical Measurements' new self-contained unit will make the determination on the spot. The calomel and glass electrodes are combined with the sample holder in a single polyethylene probe unit. Scaled from 2 to 12 pH, an accuracy of 0.1 pH is obtainable. Hearing aid type batteries will give up to 1300 hours of operation.

PICTURES IN THIS ISSUE:

p. 11—American Cyanamid; pps. 13, 14—Lyn Crawford; p. 29—Du Pont; p. 39—Allied Chemical & Dye Corp.

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"SEND us your inquiries" is never a perfunctory gesture with us. If your question pertains to the chemicals we manufacture, their actual or potential derivatives, their uses or possible uses, our organization will attack it with sincere effort and from their ability and experience will help you to the utmost. Incidentally, we do not call this work "trouble."

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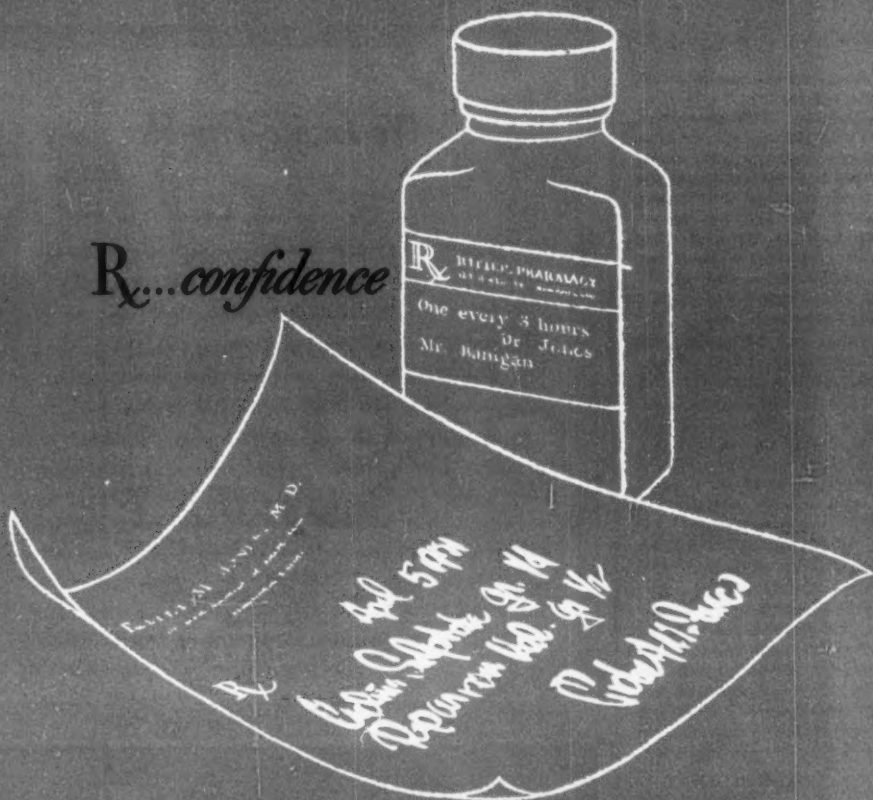
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SPECIALTIES



POWDER BLEACH: Light package vs. heavy jug.

Powder Bleach Battle

Household specialties manufacturers are now busy adding powder laundry bleach to their lines. Among the new trade names: V.I.P., Vano, Safety, "snowy".

Main selling pitch is their safe use on wool, silk, nylon and rayon. Lightness and small size of package are also being stressed as advantages over liquid bleaches.

This week as housewives trundled their baskets past the soaps and cleaners shelves of self-service grocery markets they are being confronted with a growing number of powdered laundry bleaches alongside the standard liquid products. And manufacturers are finding more of them saying "yes" to the question this immediately poses: Why lug home that heavy jug when this light package will do the same job?

These same manufacturers are driving home another point: You can use this new product on all your wash—including silk, wool, rayon and nylon—and you can't do that with liquid (hypochlorite) bleach.

Companies whose products are gaining distribution in different parts of the country include Gold Seal, Bismarck, N.D. ("snowy" bleach); Gordon Chemical, Philadelphia (V.I.P.); Chemicals, Inc., Oakland, Cal.

(Vano); and Sage Laboratories, New York (Safety Bleach). Gold Seal is suggesting a 49¢ price tag for its 20-oz container, but in some areas retailers are asking 59¢. Vano is priced at 39¢ for a pound carton, and Sage's 10-oz box, at 29¢. The latter container reflects the fear that some consumers may prefer to carry home a big jug at 24-31¢ (half gallon) rather than pay what may seem a high price for a small box, for it carries the legend "equal to two 1-quart bottles or more."

Bleach or Dye: Basis of most of the new bleaches on the market is a water softener combined with either sodium perborate or an optical bleach. One product that is now approaching national distribution is nothing more than a mixture of sodium perborate, and sodium tripolyphosphate with a little oil of wintergreen to give it a pleasant odor.

Sodium perborate, unlike chlorine products which are unsuitable for bleaching such fabrics as wool and silk, can be used on most textiles. Hence the great emphasis on "safety" in promoting the new products incorporating it. Moreover, the danger of spilling some of the liquid solution (usually 5% sodium hypochlorite) on a garment and causing bleached spots, or handling a slippery bottle with wet hands is eliminated.

Optical bleaches are the "sunshine ingredients" that have been incorporated into many soaps. These are colorless, blue-fluorescing dyestuffs which absorb ultraviolet radiation and re-emit the energy as visible blue radiation. This is different from bluing, which absorbs visible light, cutting down on the amount of reflection. With these "white dyes," the yellow tinge of the fabric is canceled, but the brightness level of the fabric is raised considerably since they add to the total reflection. They vary in chemical composition, common ones being stilbene or umbelliferone derivatives.

Sodium tripolyphosphate, of course, is the detergent builder found in most of the well-known washing products. In those, it sequesters (keeps in soluble form) scum-forming calcium and magnesium, adds to the detergency of the active ingredient, and disperses soil and soap scum. In powdered bleaches, it acts similarly, its ability to disperse soap scum left in clothes after laundering being particularly valuable.

Lot of Users: The new products will be competing to a degree with laundry bluing compounds (as do liquid bleaches), for most housewives either bleach or blue. Bluing is not as popular as bleaching, however. The Illinois Consumer Analysis for 1950, for example, shows that only 37% of all families bought bluing whereas 89% bought bottled bleach. This difference is probably in part attributable to the rise of automatic washers, although bluing suitable for such use has been developed and is widely sold.

The big effort, therefore, is being made to win users of bottle bleach to the new powder products. The small soap-type carton* which is easy to carry home, store and handle is a big talking point. Much is also being made of the new products' lack of odor and their "kindness" to hands. Their all-purpose nature, particularly

* V.I.P., an exception, comes in a 6-oz. jar, is calcium hypochlorite.

in the case of the optical bleach types which can be used to brighten colored fabrics, is being stressed in the "safety campaigns."

Liquid hypochlorite bleach, however, has its peculiar advantages. In addition to bleaching, it finds many household applications as a general cleanser, stain remover, deodorant, disinfectant and germicide. Moreover, most clothing washed and bleached at home is of cotton, and for that, liquid bleach is relatively cheap and perfectly adequate. Despite the introduction of optical bleaches into soaps and detergents, the housewife has kept on buying liquid bleach, and probably will continue to do so.

The advantages of the new powder products have been able to win customers. Acceptance of those on the market will mean more brands, and greater promotion of the brands already launched. For the long run, however, the odds are that the new products will find their greatest outlet in applications for which liquid bleaches are not suitable. These uses—bleaching of fine fabrics—are the principal ones for which they are being promoted.

Ointment Iodine

Iodine antiseptics without the sting or stain of the usual tincture is the promise of Viodine, a new preparation containing 2% iodine in emulsion form. It is now being sold in three markets, but Lanteen Laboratories, soon to make and distribute it under license from Refining Unincorporated, the developer, expects to achieve national distribution by the summer.

Iodine in a homogenized, semi-solution at 2% concentration has properties vastly different from the venerable tincture. Small fry welcome the stingless first aid—even apply it themselves. Mothers are relieved of the usual pitched battle over dressing wounds and praise the new form which leaves only faint and washable stains.

Viodine was developed by Refining Unincorporated, Chicago, as an additional use of its versatile product, corn lecithin. Tradename and manufacturing rights have been licensed to Lanteen Laboratories, Inc., which will shortly manufacture and distribute the ointment to drugstores and wholesalers along with its present line. Test marketing among doctors, nurses, and mothers has proved successful, and present distribution in Indiana, Ohio, and on the West Coast will be expanded to a national basis by this

summer. Viodine comes in half-ounce, opal-glass jars at 50¢.

Controlled Concentration: Iodine is suspended in 2% concentration in an emulsion base of oil and water with corn lecithin as the emulsifying agent. Absence of fats or greases in the ointment precludes the possibility of melting and deposition of increased concentrations of iodine on the skin. The emulsion does break down in the presence of water, such as would exude from a wound, but the lecithin and oils remain while the released iodine does its antiseptic work, and concentration is said never to exceed 2%. In addition, the lecithin remaining has an emollient effect on the skin.

The familiar deep-brown stain left by tincture is due to deposition of 100% iodine and consequent etching of the skin when the alcohol evaporates. Viodine stains on cloth are faint to begin with and are easily removed by pre-soaping before actually washing.

The ointment is recommended as a substitute for tincture in all usual applications and additionally for use on small burns. With this ointment available, tincture is in for strong competition.

No. 14 for Stanley: A new distribution center was opened in St. Louis, Mo., this week by Stanley Home Products, Westfield, Mass., manufacturer of cleaning specialties. The company's fourteenth such station in this country, it will service nearly 1,000 dealers in Missouri, Illinois, Iowa and Arkansas.

DDT in Texas: The DDT unit of the new Kolker Chemical Works plant at Houston has just been completed. With this first basic DDT unit in the Southwest, Kolker now is making both of the synthetic raw materials for the popular cotton insecticide "3-5-0" and "3-5-40" formulations (figures referring to per cent DDT, BHC and sulfur, resp.) close to large markets in that area. Its BHC unit came in last fall. Other products are being readied for production at the new Houston plant.

Drug Co. Charter: Mysan Products Co., Inc., has just been granted a charter to make and sell medical products and other products relating to the drug business in Macon, Ga.

Enzymatic Cleaner: A dry cleaning powder based on an enzyme with a great affinity for protein has been developed by Pabst Brewing Co. It

"devours" stains caused by eggs, milk, chocolate, blood, glue, and other protein-based materials. It can be used on all fabrics except synthetics made from protein-base fibers like Ardil, Caslen and Vicara.

Botanical House Moves: Home offices and plant of Allaire-Woodward, Inc., located at Peoria, Ill., since 1873, have been moved to Chehalis, Wash., by I. P. Callison & Sons, which purchased the botanical drug firm last year. Reason for the move was Callison's inability to find new quarters in Peoria after expiration of its lease on the previous building.

Allaire-Woodward operations will be conducted at two Callison plants in Chehalis, with 30 persons to be hired for that purpose.

Coincidental with moving the factory to Chehalis, a new sales office is being established in New York City under the direction of Henry Callison. Opening in April in the Chanin building, the office will represent both I. P. Callison & Sons, which produces peppermint oil, cascara concentrates, etc., and Allaire-Woodward, Inc.

Rust Inhibitor: Alox Corp.'s new oil-soluble rust inhibitor (CIW *News-letter*, Mar. 24, 1951) now going into commercial production is a mixture of complex metallic soaps. In tests, Alox-L-1673, as the new product is designated, has protected metal parts ten to fifteen times longer than previous formulations when used in 1%-20% concentration in petroleum fractions.

Alox is replacing some of its other numbers with it; the product meets recently-revised Government specifications.

Research on Alox-L-1673 began about two years ago as a result of a request for a thinner rust-preventive coating that would be easier to apply and easier to remove. Rust inhibitors generally in use are not oil-soluble, form a very hard coating difficult to get off. Alox's Par-Al-Ketone line is of that type, and this is being replaced by the new product. Solubility was one of the tough problems to be licked, but this was accomplished by the mixture of metallic soaps.

First samples were sent out February 10 of this year after salt fog, salt spray, and other laboratory tests and outdoor and shed exposures proved the superiority of the formulation. Several major oil companies are now using it and several Government arsenals are testing it for unique applications.



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Ultrapole S is a 97%-100% active amine condensate with excellent wetting and foaming properties. It is compatible with soap and synthetic detergents, and has good detergent properties on cotton, wool and rayon. The pH of a 1% solution is 9.2 at 25° C. Solutions of Ultrapole S have considerable body, and reach a maximum viscosity at 8%-10%.

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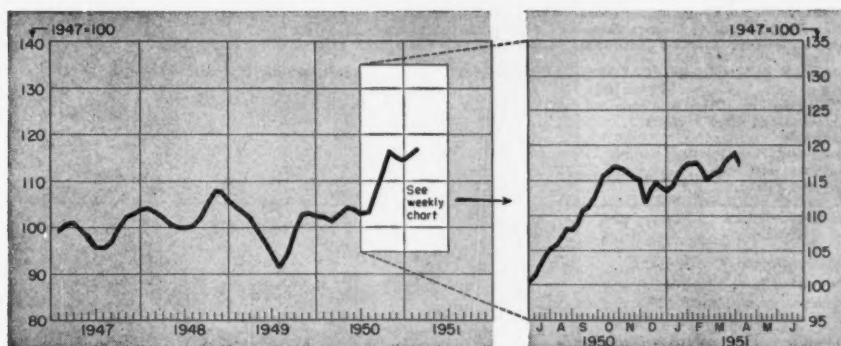
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CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX—Basis: Total Man-Hours Worked in Selected Chemical Industries

Government allocation of naphthenic acid supplies focuses industrial attention on tall oil. This by-product of kraft paper manufacture, cheap and abundant, is approaching an annual production of 200 thousand tons. Alerted consumers may find the answer there to some shortage problems in paint driers, fatty acids, rosin and turpentine.

Sounds of engine-knocking will be heard along the highways unless the tetraethyl lead situation improves. In the view of the Petroleum Administration for Defense, gasoline refiners would do well not to exceed their quotas in hopes of getting more later.

Price indicator for petrochemicals: Contract propane prices in Texas continue to hold steady as production keeps pace with demand for chemical conversion and fuel uses. A recent five-year petrochemical contract was inked at the 3.5¢ a gallon figure, and a one-year agreement was reached at 3.75¢ a gallon.

Young in years, but growing vigorously, antibiotics now comprise 50% of all ethical drug sales. Last year's volume hit \$200 million, and the expansion shows no signs of a let-up. The United States is in the fortunate position of making 70% of the penicillin, 80% of the streptomycin, and 95% of the newer wide-spectrum antibiotics made in the world today.

Prospects of meeting the 1951 synthetic rubber goal of 800 thousand tons are improved now that all 22 of the government-owned plants have been reactivated. Sure sign of progress: Consumption of rubber chemicals for synthetic has doubled in the last twelve months.

Small plastics fabricators buying in the spot market now have to pay \$1.25 a pound for polyethylene, and 85¢ for the same quantity of polystyrene. These quotations are more than triple prices at the manufacturers' level, vividly point up the shortage.

MARKET LETTER

MARKET LETTER

WEEKLY BUSINESS INDICATORS

| | Latest Week | Preceding Week | Year Ago |
|--|-------------|----------------|-------------|
| Chemical Industries Output Index (1947=100) | 118.0 | 118.2 | 104.7 |
| Bituminous Coal Production (Daily Average, 1000 Tons) | 1,689.0 | 1,687.0 | 2,218.0 |
| Steel Ingot Production (Thousand Tons) | 2,045.0 | 2,047.0 | 1,864.0 |
| Wholesale Prices—Chemicals and Allied Products (1926=100) | 145.3 | 145.5 | 117.3 |
| Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.) | 218.5 | 215.9 | 173.8 |
| Chemical Process Industries Construction Awards (Eng. News-Record) | \$9,024,000 | \$20,465,000 | \$2,750,000 |

MONTHLY BUSINESS INDICATORS—WHOLESALE PRICES (1926=100)

| | Latest Month | Preceding Month | Year Ago |
|---|--------------|-----------------|----------|
| All Commodities (Other than Farm and Foods) | 171.8 | 170.3 | 145.9 |
| Chemicals and Allied Products | 147.2 | 144.4 | 115.2 |
| Chemicals | 139.0 | 138.1 | 114.7 |
| Drugs and Pharmaceuticals | 185.4 | 184.6 | 121.4 |
| Fertilizer Materials | 118.1 | 117.3 | 116.9 |
| Oils and Fats | 217.3 | 200.4 | 120.9 |

The shortage of drums and carboys is acute and worsening. Here are two examples: Although production of nitric acid is more than ample to cope with demand, the dearth of carboys is hurting deliveries. Because drums are hard to come by, Hercules Powder Co. had to close down their nitrocellulose plant at Parlin, N. J., for several days last month.

Agreements just concluded among the Allied occupation authorities in Germany have removed most of the production restrictions on chemical manufacture, except those used directly for military purposes.

Revival of the European chemical industry is pointed up by the disappearance of naphthalene imports with a concomitant price jump of 1-2¢ a pound. This versatile intermediate is being converted in overseas plants, means that much less for U. S. phthalic producers.

Now is the time for shipping anti-freeze. The industry advisory committee in Washington is trying to arrive at equitable price standards for permanent and alcohol types. Last year's gallon prices of \$3.50 for ethylene glycol and \$1.25 for methanol were boosted 25¢ a gallon in January before GCPR went into effect.

Sometimes shortage of one chemical gives another chemical a chance to capture new markets. Latest case: increased utilization of gluconic acid in the textile industry to relieve the acetic acid supply lack.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 9, 1951

| UP | | | | | | | |
|---------------------------|--------|-----------|---------------------------|--|--------|-----------|--|
| | Change | New Price | | | Change | New Price | |
| Candelilla Wax | \$.02 | \$.75 | Cresylic Acid, imp., gal. | | \$.10 | \$1.52 | |
| Cedarwood Oil | .10 | .75 | Glycerine, sapon. | | .02 | .48 | |
| Cocoa Butter | .005 | .755 | Naphthalene, crude, imp. | | .015 | .085 | |
| Corn Starch, powd., cwt. | .03 | 7.14 | Rosin, gum K, N.Y., cwt. | | .15 | 9.70 | |
| DOWN | | | | | | | |
| Anise, star | .01 | .37 | Ouricury Wax, refined | | .08 | .95 | |
| Bergamot Oil, NF, Italian | .25 | 8.50 | Peppermint Oil, nat. | | .10 | 7.75 | |
| Coconut Oil, tanks, Pac. | .01 | .195 | Shellac, refined, bags | | .02 | .66 | |
| Copra, cif., Pac./ton | 5.00 | 265.00 | Spearmint Oil, USP | | .05 | 5.80 | |
| Menthol, nat, USP | .25 | 11.75 | | | | | |

All prices per lb. unless quantity is stated



ANILINE RUBBER ACCELERATORS: Better rubber faster.

Aniline Come-Back

Aniline demand mounts as synthetic rubber industry heads for 1951 production goal of 800 thousand tons. Present supply is adequate unless mobilization requirements for defense rise sharply.

Long-term trend: Less aniline will be used for dyes, more in synthetic rubber chemicals and chemical intermediates.

New production capacity has been authorized, will have early call on additional benzene supplies next year.

As the present emergency compels full realization of the need for a sustained synthetic rubber industry, the demand for aniline becomes insistent and nonpriority uses are relegated to a back seat. It seems that in times of mobilization the reliance on a healthy aniline industry is clearly defined, not only because there are urgent demands for rubber chemicals, but all of its varied applications including dyes, explosives, and sulfa drugs.

This driving incentive for more aniline and its derivatives does not mean that peacetime uses are not extensive, for the 100 million pound category could hardly be considered bush league. But in the past at least, aniline dyes have been the major peacetime use, and tended to fluctuate with the notoriously mercurial textile industry. A considerable slump in aniline production occurred in 1949 with textiles in the doldrums, and synthetic rubber production declining to half the World War II output.

Production Record: A lot of tonnage

of aniline and its derivatives has entered into the U.S. economy since the days of World War I. Some of today's giants in the chemical industry succeeded at that time in achieving independence from German importations, and laying firm foundations for the present organic chemical industry. In the period following World War I, the aniline dye and rubber chemical industry grew steadily, encouraged by a favorable tariff. In the thirties, U.S. production hovered in the 30-40 million pound range, as increase usage in rubber chemicals and drugs offset the decline in dyestuffs caused by the introduction of the superior anthraquinoid dyes.

With the onset of World War II, aniline production jumped fantastically, spurred by demands for the mushrooming synthetic rubber industry, explosives, dyes and pharmaceuticals. All-out production in industry and new government facilities catapulted capacity to something like 130 million pounds, not over 40% going

into civilian channels. Much of the military requirements went into explosives in the form of diphenylamine and tetryl, but aniline-based sulfa drugs also gained national prominence.

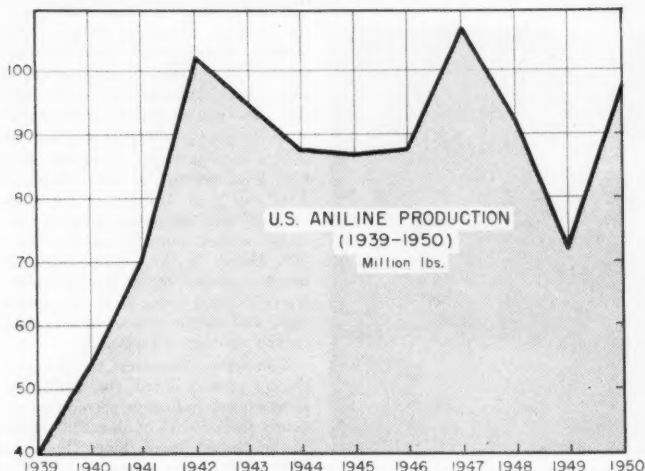
In the post-war period demand for aniline intermediates continued at a high level during the boom years of 1947 and 1948. The general recession in 1949 and the inactivation of synthetic rubber capacity resulted in a 30% slump in the aniline business, mostly regained before Korea. Industry production today is at the alltime high, and further expansion is limited by the absence of benzene.

Competing Processes: Largest producing process is still the traditional nitrobenzene reduction, accounting for nearly three-fourth of all aniline made in the United States. Since the early 1930 period, Dow Chemical has used the continuous ammonolysis of chlorobenzene for manufacture of the remaining 25%. Refinements in nitration and reduction procedure have enabled the batch method to be competitive with the Dow process. The continuous process is inherently more economical, but batch operation permits smaller capital investment and greater flexibility. In an industry where capacity has usually exceeded supply and been subject to wide fluctuation, the nitration process shows no signs of slipping.

Price Trends: Considering the erratic behavior of aniline production in the past the price has remained remarkably steady. This fact can be attributed to the potential of idle capacity and the implied competitive aspect of the major producing processes. From a price of 13¢ in 1929, the value declined to 12¢, then rose to 15¢ in 1939. During World War II, the quotations were set at 14¢, reached 16¢ in last year, and is currently maintained by OPS ceilings in the 17¢ range. Spot prices of aniline and aniline derivatives in the resale market approximately double these figures.

Who Wants It: The most detailed picture of aniline end-uses was compiled in 1944, showing the distribution of aniline to military and civilian purposes, based on production only. This pattern represents the needs for aniline in a mobilized economy, with a synthetic rubber industry of approximately the same size at the latter part of this year.

Insofar as industry requirements are concerned, distribution of uses is essentially the same today. Military needs are different, but indicate relative demands on privately-owned production facilities:



| | |
|-------------------------------|--------------|
| Direct military | 6.2 |
| Foreign | 1.9 |
| Civilian Industry | |
| Rubber Chemicals | 51.4 |
| Dyes, Pigments, Intermediates | 21.5 |
| Drugs and Pharmaceuticals | 4.2 |
| Stabilizers and Explosives | 3.4 |
| Photochemicals | 2.2 |
| Petroleum Refining | 1.8 |
| Resins and Plastics | 1.7 |
| Miscellaneous | 5.7 |
| Total | 100.0 |

This production amounted to 90 million pounds, in addition to which government-owned facilities produced a considerable amount of diphenylamine, tetryl, and aviation gasoline additives. Applications of aniline in rubber chemicals include both accelerators and antioxidants about equally divided in volume. These comprise benzothiazole derivatives, thiocarbonyl, and aldehyde condensation products.

Prospects for Growth: The immediate future of aniline is closely bound to the degree of military mobilization and the rapid expansion of the synthetic rubber industry. Whatever the military prospects may be, there is not much doubt that from now on, the U.S. synthetic rubber industry is here to stay as a vital factor in the industrial world. This single development alone will stabilize the aniline industry considerably.

Use of aniline dyes and pigments should maintain present levels, but may lose a certain amount to the growth of other dyes which are more suitable for synthetic textiles. Substantial growth can also be expected in applications for pharmaceuticals,

photochemicals, resins, and wetting agents. Prices will tend to move upward both because of higher raw materials costs and the disappearance of idle capacity. But closer to the realities of today, the non-defense users of aniline products would not be ill-advised to search for substitutes.

Inorganic Uptrend

Latest figures show that chemicals to feed the demands of mobilization show no signs of slackening the record pace of recent months. Out of 37 major inorganic chemicals, 24 were produced in larger volume than in December, and 32 registered substantial gains over the same period a year ago.

It is significant that all-time monthly highs were established in the production of synthetic ammonia, chlorine, and caustic soda. On the other hand, sulfuric acid production declined slightly even as the voices of industry and agriculture were clamoring for more in Washington. A similar decrease for hydrochloric acid resulted in a rather acute shortage in February, but this situation has now been relieved with the seasonal surge in insecticide production based on chlorine.

Production of insecticides will still be somewhat inadequate to meet simultaneous demands for agricultural, defense and civilian product usage. Estimated shortages of 10-25% in DDT, BHC, and toxaphene are predicted for the current year. Most encouraging feature of the insecticide picture is the stepped-up production of calcium arsenate, rising almost 50% from December, in an attempt to substitute for insecticides based on chlorine.

GOVT. NEEDS

Raritan arsenal, Metuchen, N.J., will receive bids until Apr. 17 for insulating wax (Inv. No. 51-424) and rubber solvent (Inv. No. 51-425). Aviation supply office, 700 Robbins Ave., Philadelphia, will receive bids until Apr. 16, on invitation No. B-54012 for following:

- 52,200 gals. various type of primer paint
- 49,200 gals. various types paint
- 8,550 gals. synthetic enamel
- 1,600 gals. repellent
- 4,100 gals. spar varnish

Chief, Purchase Div., Federal Supply Service, GSA, 1114 Commerce St., Dallas, Tex., will receive bids until Apr. 16 for 20,000 lbs. trisodium phosphate (Inv. No. FW-12263-A), for 2,500 gals. steam-distilled turpentine (Inv. No. FW-12957), and for 960 quarts of fire extinguisher fluid (Inv. No. FW-12959).

Chief, Procurement Div., Veterans Administration, Washington 25, D.C., will receive bids until Apr. 16 on Invitation No. A-89 for:

- 450 bottles phenylephrine hydrochloride solution (1-PC)
- 3,360 lbs. white petrolatum (1-lb.)
- 216 cans white petrolatum (10-lb.)

GOVT. AWARDS

Dallas Chemical Procurement District: Potassium chlorate—Sinclair & Valentine Co., New York. Chicago Chemical Procurement District: Chlorinated paraffin, type 1—Helen Curtis Industries, Inc., Chicago. Armed Services Med. Proc. Agency, Brooklyn, N.Y.: Phosphoric acid, potassium chloride, potassium dichromate soda—Mallinckrodt Chemical Works, St. Louis; Chloroquine diphosphate tablets—Winthrop-Stearns, Inc., New York; Penicillin and potassium crystalline tablets—E. R. Squibb & Sons, N.Y.; Hexavitamin tablets—Chase Chemical Co., Newark, N.J. Navy Aviation Supply Office, Philadelphia:

- quick-drying enamel—Sherwin-Williams Co., Phila.
- exterior glyceryl enamel—Reliance Varnish Co., Louisville
- exterior enamel—Zac-Lac Paint & Lacquer Co., Atlanta.

By Navy Department

- Plastic acrylic sheet—Rohm & Haas, Phila.
- Dipentene (Refined terpene hydrocarbon)—Newport Industries, New York City
- Cellulose nitrate thinner—Glove Solvents Co., Phila.
- Cellulose nitrate thinner—George Senn, Inc., Phila.
- Cellulose nitrate thinner—American Marietta Co., Los Angeles

B O O K S

Methods of Operations Research, by Philip M. Morse and George E. Kimball. The Technology Press of Massachusetts Institute of Technology and John Wiley & Sons, Inc., New York, N. Y.; 158 pp., \$4.

Former members of the Operations Research Group of the U. S. Navy, the authors explain and demonstrate how the techniques of this applied science can be employed in making executive decisions concerning operations in both military and non-military fields. The use of probability and statistical theory in analyzing operational data and problems, preparatory to making such decisions is explained in detail.

The writers define operations research as "a scientific method of providing executive departments with a quantitative basis for decisions regarding the operations under their control" and go on to discuss the tools and methods of the subject as well as the limitations. Drawing upon their wartime background, Dr. Morse and Dr. Kimball describe the techniques of operations research as they were developed for military purposes during World War II but emphasize their peacetime applications in presenting an actual plan for establishing an operations research group. The ultimate aim of the science is not only the evaluating of past experience, but more important, the understanding of future operations well enough to modify them if necessary so as to produce better results.

Progress in Chromatography, 1937-1938, by L. Zechmeister. John Wiley & Sons, Inc., New York, N. Y.; xviii+368 pp., \$8.

A survey of adsorption procedures as applied to problems in chromatography, this volume reviews new methods developed since 1938, such as partition chromatography, paper chromatography, the Tiselius-Claesson method, exchange chromatography, etc. Since this volume is virtually an extension of a previous book on the basic principles and practice of chromatography, the author utilizes a "progress report" method to present up-to-date information on methods, adsorbents, and solvents. After a general section on the principles, background, and methods of chromatography, the author sets forth in a specialized section the differences in properties of the various organic substances important in chromatography. The applications of these biological compounds to technology are set forth as

well as information on inorganic chromatography. In addition to providing a critical analysis of the various data furnished, the author includes an extensive bibliography for those interested in further research.

German-English and English-German Dictionary for Scientists, by O. W. Leibiger and I. S. Leibiger. J. W. Edwards, Ann Arbor, Mich.; 756 pp., \$8.

This bilingual dictionary records the vocabulary of every field in the sciences especially those of chemistry and physics. Containing almost 90,000 entries, the dictionary is the result of 25 years of research work and translation activities on the part of the author-scientists.

Starting in the early 1920's the authors systematically collected all scientific words which could not be found in existing dictionaries. Before and during the years of the Second World War, a large number of words and expressions were added; some were created as the outgrowth of new developments in aerodynamics, radio, high-polymer chemistry, nuclear physics, biophysics, etc.; some were a by-product of the political influence dominant in Germany. The collection has been thoroughly screened with only those words retained that have a more permanent value to scientists. Most of the words contained in the dictionary have three types of synonyms: the older scientific expression, the arian scientific terminology as accepted by the German prewar government, and the most recent term, acceptable to the modern scientist.

Briefly Listed

THE MARKETING OF CHEMICAL PRODUCTS, by Robert S. Aries and William Copulsky. 149-page study collates and evaluates the literature on the subjects of chemical marketing and market research in the chemical processing sphere so as to give a clear and workable understanding of the significance of the selling, distribution and marketing processes in the chemical picture. Chemonomics, Inc., 400 Madison Ave., New York 17, N. Y. Price: \$3.

ASTM MANUAL ON MEASUREMENT AND SAMPLING OF PETROLEUM AND PETROLEUM PRODUCTS, 132-p. manual containing recommended methods for measuring the volume (or weight) of petroleum and its products, and for obtaining representative samples thereof; also included are sections on ASTM methods of gaging, temperature measurement and sampling. Available from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. Price: \$2 per copy, paper cover; \$2.65, cloth cover.

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Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

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NEW PRODUCTS

| | |
|----------------------------|-----|
| Hydantoin Lubricants | 23A |
| N-bromoacetamide | 25A |
| Violite Blue 3-60 | 25B |
| Violite Light Blue 18-50 | 25B |
| Santophen 45 | 27A |
| Salicylamide | 27B |
| Glucose-6-phosphate | 27C |
| Stearic Powders | 27D |
| dl-Ornithine Hydrochloride | 27E |
| Fluorescent Cotton | 27F |

NEW EQUIPMENT

| | |
|-------------------------|-----|
| Evaporator | 30A |
| Fluoroplastic Equipment | 29A |
| pH Meter | 31A |

TECHNICAL LITERATURE

| | |
|--------------------|-----|
| CHEMICALS | |
| Fine Chemicals | 44C |
| Organic Chemicals | 44A |
| Protective Coating | 44B |

EQUIPMENT

| | |
|----------------------------|-----|
| Amplifier System | 44K |
| Centrifugal Pumps | 44D |
| Corrosion-Resistant Cement | 44J |
| Ductile Bismuth Wire | 44H |
| Dust Precipitators | 44E |
| Frequency Controls | 44G |
| Refrigeration Units | 44L |
| Vapor Adsorber | 44F |
| Viscator Instruments | 44I |

GENERAL

| | |
|-------------------|-----|
| Company History | 44N |
| Military Business | 44M |
| Textile Research | 44O |

PRODUCTS ADVERTISED

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| | |
|--|------|
| Calculating machines, electronic | 26 |
| Chemicals | |
| Acetic acid | 21c |
| Acetone | 21b |
| Agricultural | 15f |
| Allyl amine | 1a |
| Allyl isothiocyanate | 1c |
| Allyl mercaptan | 1d |
| Allyl thiourea | 1f |
| Amine condensate | |
| Ultrapole G | 36b |
| Ultrapole S | 36a |
| Ammonium fluoroborate | 45c |
| Aromatic | 2 |
| Asphalt specialties | 46d |
| Carbon black | 46c |
| Catalysts | 15b |
| Catalysts, vanadium | 8-9d |
| Catechol, bulletin C-9-127 | 25 |
| Ceramic opacifiers & colors | 15e |
| Commodities | 15h |
| Diallyl amine | 1b |
| Diallyl sulfide | 1e |
| Diethylene glycol for | |
| Casting resins | 10a |
| Plasticizers | 10d |
| Oil-in-water emulsions | 10b |
| Water-set printing inks | 10c |
| Diethylthiocarbonyl chloride data sheet B-51 | 7 |
| Diiodo hydroxy quinoline | T41a |
| Di-t-butyl peroxide | T20 |
| Driers | 46b |
| Driers & metal soaps | 15c |
| Fine | 32 |
| Fluorides | 15g |
| Formaldehyde | 21a |
| Fungicides | 15j |
| General line | T31 |
| Glycerine | 15i |
| Heavy | 1 |
| Lauroyl chloride | 3a |
| Lead nitrate | 45d |
| Lignin | 3b |
| Lithium compounds | B31a |
| Maltol | 3c |
| Mannuronic acid | 3d |

| | |
|------------------------------|------|
| Muriate & sulphate of potash | B31b |
| Optical crystals, synthetic | 15d |
| Para amino benzoic acid | T41b |
| Phthalic anhydride | 24 |
| Plasticizers | 46f |
| Polybutenes for | |
| Adhesives | 16b |
| Electrical insulation | 16c |
| Molded rubber specialties | 16a |
| Potassium hydroxide, pellets | 4b |
| Potassium nitrite | 45b |
| Sebacic acid | B20 |
| Soda ash | 23 |
| Sodium hydroxide | 45a |
| Sodium hydroxide, pellets | 4a |
| Solvents, petroleum | 35 |
| Stearates, metallic | 46a |
| Vinyl resin stabilizers | 46g |
| Wax, sunolite | 46e |

Chemical plants

| | |
|-------------------------------|------|
| Electrolytic chlorine process | 8-9b |
| Sludge acid recovery | 8-9c |
| Sulfuric acid | 8-9a |

Containers

| | |
|--|------|
| Drums, fibre | 22 |
| Shipping sacks, paper, multi-wall | 30 |
| Electroplating salts, anodes and processes | 15a |
| Research laboratories | B41 |
| Sludge acid recovery booklet | 8-9e |

SEARCHLIGHT SECTION

(Classified Advertising)

| | |
|---------------------------------|----|
| EMPLOYMENT | |
| Employment Service | 42 |
| Selling Opportunities Wanted | 42 |
| BUSINESS OPPORTUNITIES | |
| Offered | 42 |
| Wanted | 42 |
| EQUIPMENT | |
| (Used or Surplus New) | |
| For Sale | 42 |
| WANTED | |
| Miscellaneous | 42 |
| ADVERTISERS INDEX | |
| Consolidated Products Co., Inc. | 42 |
| First Machinery Corp. | 42 |
| Jasper Machinery Co. | 42 |
| Perry Equipment Corp. | 42 |
| Robertson Co., H. H. | 42 |
| Simmons Products Co. | 42 |

READER SERVICE COUPON

Mail to Chemical Industries Week, 330 W. 42nd St., N. Y. 15, N. Y.

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COMPANY _____

ADDRESS _____

CITY & STATE _____

Editorial Items

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 23A | 25B | 27C | 27F | 31A | 44C | 44F | 44I | 44L |
| 25A | 27A | 27D | 29A | 44A | 44D | 44G | 44J | 44M |
| 25B | 27B | 27E | 30A | 44B | 44E | 44H | 44K | 44N |
| | | | | | | | | 44O |

Advertisements

| | | | | | | | | | |
|----|----|------|------|-----|-----|-----|-----|------|------|
| 1 | 1f | 4a | 8-9d | 15a | 15g | 22 | T31 | T41a | 46a |
| 1a | 2 | 4b | 8-9e | 15b | 15h | T20 | 24 | B31a | T41b |
| 1b | 3a | 7 | 10a | 15c | 15i | B20 | 25 | B31b | B41 |
| 1c | 3b | 8-9a | 10b | 15d | 15j | 21a | 26 | 32 | 45a |
| 1d | 3c | 8-9b | 10c | 15e | 15k | 21b | 28 | 35 | 45b |
| 1e | 3d | 8-9c | 10d | 15f | 16a | 21c | 30 | 36a | 45c |
| | | | | | | | | 36b | 45d |
| | | | | | | | | | 46g |

Expires July 14, 1951

BOOKLETS

Chemicals

Organic Chemicals

32-p. technical manual giving data on the specifications, physical and chemical properties, solubility and packaging of those essential chemical compounds finding their primary application in the cosmetics industry but also used in the pharmaceutical, textile, and lubricating oils fields; the final section sets forth the step-by-step formulation of the various types of cosmetic preparations. Kessler Chemical Co., Inc.

Protective Coating

4-p. bulletin describing "Alodine," a phosphate coating, and the electroless, chemical process by which it forms an amorphous phosphate surface on aluminum, thereby bonding paint to aluminum and protecting the metal. American Chemical Paint Co.

Fine Chemicals

Price list, effective April 1, 1951, listing the firm's 62 compounds available to research workers including 14 new additions such as the recently announced "A" and "B" isomers of adenosine-3-phosphoric acid, which can now be obtained in highly purified form. Schwarz Laboratories, Inc.

Equipment

Centrifugal Pumps

24-p. booklet illustrating and describing the firm's line of general-purpose horizontal end-suction centrifugal pumps, particularly adapted to continuous duty pumping of water and other clear liquids in a wide variety of services as well as for system assemblies, such as air-conditioning, commercial laundry equipment, dairy equipment, etc. Peerless Pump Div., Food Machinery Corp.

Dust Precipitators

12-p. catalog dealing with all purpose mechanical type dust precipitators, designed to handle fly ash, cinders and industrial dusts, capable of being shipped in factory assembled sections, all matched for field erection and assembly. American Blower Corp.

Vapor Adsorber

4-p. folder covering the vapor adsorber, a device effecting the continuous removal of petroleum vapors from air that is to be used in critical pneumatic operations, where petroleum vapor, liquids or dirt would have detrimental effects. Sels Corporation of America.

Frequency Controls

8-p. pamphlet covering polarized field frequency controls for synchronous motors of the standard interrupting capacity type, complete with data on ratings, weights, dimension drawings, layout drawings and specifications for each type of control. Electric Machinery Mfg. Co.

Ductile Bismuth Wire

20-p. booklet explaining the metallurgical and electrical properties of bismuth and outlining its new commercial importance especially in those branches of industry which require small wires for winding into coils of any size. Fitzpatrick Electric Supply Co.

Viscorator Instruments

12-p. catalog devoted to viscorator instruments that provide an instantaneous method for determining viscosity values for industrial processes and featuring the auto-sampling viscorator, which affords a constant meter sample flow rate in a self-contained unit. Fischer & Porter Co.

Corrosion-Resistant Cement

Illustrated bulletin showing the step-by-step procedure to be followed in applying corrosion-resistant cement over steel gridwork, the cement-steel combination being exceptionally resistant to erosion. Pennsylvania Salt Manufacturing Co.

Amplifier System

4-p. pamphlet giving technical details on the operation and application of an amplifier system especially adaptable to the detection and correction of error signals and operation of null-balance systems. Minneapolis-Honeywell Regulator Co.

Refrigeration Units

Bulletin describing compressor units designed for operation in air conditioning and product and industrial refrigeration; detailed specifications and physical data diagrams are included. Worthington Pump and Machinery Corp.

General

Military Business

Companion reports on how to get military business: the first, "Selling to the Armed Forces" supplies a listing of the major articles being bought by military services and the offices that buy them; the accompanying report explains the procedures to be followed in establishing and maintaining contact with buying offices. Research Institute of America, Inc.

Company History

32-p. humorous history entitled, "A Thirty Year History in the Lighter Vein" following the growth of Foster D. Snell, Inc., during its 30 years as consultants in the field of chemical engineering and chemistry. Foster D. Snell, Inc.

Textile Research

24-p. pictorial booklet describing the Institute's facilities for textile research and development and the type of projects they can handle along with a photographic tour of each department—pointing out equipment and services available. Philadelphia Textile Institute.

ADVERTISER'S INDEX

| | |
|--|------------|
| American Cyanamid Co. | 24 |
| American Potash & Chemical Corp. | B31 |
| Baker & Adamson Products, General Chemical Division, Allied Chemical & Dye Corp. | 3rd Cover |
| Baker Chemical Co., J. T. | 4 |
| Celanese Corporation of America | 21 |
| Chemical Solvents, Inc. | 42 |
| Continental Can Co. | 22 |
| Delta Chemical Works | 3 |
| Dodge & Olcott, Inc. | 2 |
| Dow Corning Corp. | 42 |
| Edwal Laboratories, Inc. | 1 |
| Eso Standard Oil Co. | 35 |
| Fisher Chemical Co., Inc. | T41 |
| Hardesty Chemical Co., Inc. | B20 |
| Harshaw Chemical Co., The | 15 |
| International Business Machines Corp. | 26 |
| Jefferson Chemical Co., Inc. | 10 |
| Koppers Company, Inc. | 25 |
| Lucidol Division, Novadel-Agene Corp. | T20 |
| Mallinckrodt Chemical Works | 32 |
| Mann & Co., Inc., George | 42 |
| Mathieson Chemical Corp. | 2nd Cover |
| McGraw-Hill Book Co., Inc. | 27 |
| Monsanto Chemical Co. | 8 & 9 |
| Oldbury Electro-Chemical Co. | T31 |
| Oronite Chemical Co. | 16 |
| Raymond Bag Co. | 30 |
| Sauerisen Cements Co. | 42 |
| Sharples Chemicals, Inc. | 7 |
| Snell, Inc., Foster D. | B41 |
| Starkweather Co., Inc., J. U. | 42 |
| Ultra Chemical Works, Inc. | 36 |
| Witco Chemical Co. | Back Cover |
| Wyandotte Chemicals Corp. | 28 |

BUSINESS STAFF

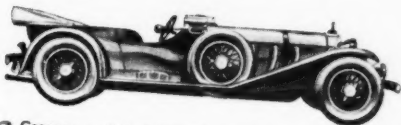
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|------------------|--|
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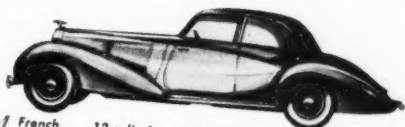
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